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WITMER STONE



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BLATCHLEY, W. S., 1530 Park Ave., Indianapolis, Ind.....	1895
BLOOMFIELD, MRS. C. C., 723 Main St., W., Jackson, Mich.....	1901
BOARDMAN, MISS E. D., 416 Marlborough St., Boston, Mass.....	1906
BOGARDUS, MISS CHARLOTTE, Elm St., Coxsackie, N. Y.....	1909
BOGERT, WILLIAM S., Box 53, Leonia, N. J.....	1904
BOHLMAN, HERMAN T., 202 Occident St., Portland, Ore.....	1901
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo....	1909
BOND, HARRY L., Lakefield, Minn.....	1908
BOOTH, SHERMAN M., Glen Cove, Ill.....	1911
BORLAND, WM. G., 17 Broad St., New York City.....	1911
BOSSON, CAMPBELL, 722 Tremont Bldg., Boston, Mass.....	1906
BOUDINOT, MRS. H. R., 302 Rusholme St., Davenport, Iowa.....	1909
BOWDISH, B. S., Demarest, N. J.....	1891
BOWDISH, MRS. B. S., Demarest, N. J.....	1902
BOWDITCH, HAROLD, Mass. General Hospital, Boston, Mass.....	1900
BRACKEN, MRS. HENRY MARTYN, 1010 Fourth St., S. E., Minneapolis, Minn.....	1897
BRADFORD, MOSES B. L., Concord Public Library, Concord, Mass....	1889
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.....	1902
BRANDRETH, COURTENAY, Cliff Cottage, Ossining, N. Y.....	1905
BRANDRETH, FRANKLIN, Cliff Cottage, Ossining, N. Y.....	1889
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich....	1893
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....	1910
BRIDGE, MRS. EDMUND, 52 Wyman St., West Medford, Mass.....	1902
BRIGHT, MISS ANNA L., Pottsville, Pa.....	1903
BRIMLEY, H. H., Raleigh, N. C.....	1904
BRISTOL, JOHN I. D., 45 West 74th St., New York City.....	1907
BROCK, DR. HENRY HERBERT, 687 Congress St., Portland, Me.....	1894
BROOKS, WINTHROP S., Milton, Mass.....	1907
BROOKS, REV. EARLE AMOS, Weston, W. Va.....	1892
BROWN, MISS ANNIE H., 31 Maple St., Stoneham, Mass.....	1909
BROWN, ARTHUR L., 217 Spring St., West Roxbury, Mass.....	1908
BROWN, C. EMERSON, Boston Society Natural History, Boston, Mass....	1908
BROWN, EDWARD J., U. S. Nat. Museum, Washington, D. C.....	1891
BROWN, HUBERT H., Beamsville, Ontario.....	1889
BROWN, PHILLIP G., 85 Vaughan St., Portland, Me.....	1911
BROWN, STEWARDSON, 20 E. Penn. St., Germantown, Philadelphia, Pa....	1895
BROWN, WM. JAMES, 250 Olive Ave., Westmount, Quebec.....	1908

BROWNING, WM. HULL, 16 Cooper Square, New York City	1911
BRUEN, FRANK, 65 Prospect St., Bristol, Conn.....	1908
BUBIER, GEO. M., 185 Franklin St., Lynn, Mass.....	1911
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....	1898
BURKE, WM. BARDWELL, 130 Spring St., Rochester, N. Y.....	1901
BURNETT, WILLIAM L., Fort Collins, Colo	1895
BURT, H. P., 355 Union St., New Bedford, Mass.....	1908
BURTCH, VERDI, Branchport, N. Y.....	1903
BUTLER, Miss CHARLOTTE W., 500 Audubon Road, Boston, Mass....	1904
BUXBAUM, Mrs. CLARA E., St. Joseph, Mich.....	1895
CABOT, LOUIS, Brookline, Mass.....	1904
CADUC, Eugene E., 563 Massachusetts Ave., Boston, Mass	1910
CALLENDER, JAMES PHILLIPS, 603 Springfield Ave., Summit, N. J....	1903
CARPENTER, Rev. CHARLES KNAPP, 311 Park St., Elgin, Ill.....	1894
CARPENTER, GEORGE I., 696 Halsey St., Brooklyn, N. Y.....	1907
CARRIKER, M. A., Jr., Santa Marta, Colombia.....	1907
CARTER, JOHN D., Lansdowne, Pa.....	1907
CASE, CLIFFORD M., 7 Holcomb St., Hartford, Conn.....	1892
CASH, HARRY A., 54 Spring St., Pawtucket, R. I.....	1898
CASKEY, ROBERT C., 58 Mills St., Morristown, N. J.....	1908
CATLIN, JAMES P., Ottawa, Ill.....	1905
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston, Mass.....	1885
CHAMBERS, W. LEE, "The Condor," Los Angeles, Cal.....	1907
CHAPIN, Prof. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass....	1896
CHAPIN, JAMES, 330 W. 95th St., New York City.....	1906
CHAPMAN, Mrs. F. M., Englewood, N. J.....	1908
CHAPMAN, ROY, 507 15th Ave., S. E., Minneapolis, Minn.....	1911
CHASE, SIDNEY, 346 Beacon St., Boston, Mass.....	1904
CHEESMAN, M. R., 75 W. 4th St., S., Salt Lake City, Utah.....	1911
CHRISTIE, EDWARD H., 5069 Kensington Ave., St. Louis, Mo.....	1910
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....	1901
CLARK, B. PRESTON, Box 2862, Boston, Mass.....	1907
CLARK, EDWARD B., Hamilton Hotel, Washington, D. C.....	1900
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....	1895
CLARKE, Mrs. ARTHUR E., Staupe Place, Manchester, N. H.....	1909
CLARKE, CHARLES E., 11 Chetwynd Road, West Somerville, Mass....	1907
CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass.....	1896
CLARKE, ROWENA A., Kirkwood Station, St. Louis, Mo.....	1906
CLARKE, Dr. WM. C., 200 W. 56th St., New York City	1909
CLAY, CHAS. IRVIN, Box 353, Eureka, Cal.....	1911
CLEAVES, HOWARD H., Princes Bay, Staten Island, N. Y.....	1907
CLEVELAND, Miss LILIAN, Woods Edge Road, West Medford, Mass....	1906
CLEVELAND, Dr. CLEMENT, 925 Park Ave., New York City.....	1903
CLEVELAND, WM. BINGHAM, Burton, Ohio.....	1909
COALE, HENRY K., Highland Park, Ill.....	1883
COBB, Miss ANNIE W., 301 Mass. Ave., Arlington, Mass.....	1909

COBB, STANLEY, 340 Adams St., Milton, Mass.....	1909
CODMAN, DR. ERNEST A., 227 Beacon St., Boston, Mass.....	1909
CODMAN, JOHN S., Quail St., West Roxbury, Mass.....	1908
COFFIN, MISS LUCY V. BAXTER, 3232 Groveland Ave., Chicago, Ill.....	1905
COLBURN, ALBERT E., 744 S. Broadway, Los Angeles, Cal.....	1891
COLE, DR. LEON J., 1815 University Ave., Madison, Wis.....	1908
COLVIN, WALTER S., Box 2021, Osawatomie, Kan.....	1896
COMEY, ARTHUR C., 424 E. 13th St., Chester, Pa.....	1902
COMMONS, MRS. F. W., 2437 Park Ave., Minneapolis, Minn.....	1902
CONEY, MRS. EDITH A., Palisade Ave., Windsor, Conn.....	1906
COOK, MISS LILIAN GILLETTE, 165 W. 82d St., New York City.....	1899
CÔPE, FRANCIS R., Jr., E. Washington Lane, Germantown, Pa.....	1892
COPELAND, DR. ERNEST, 302 Goldsmith Bldg., Milwaukee, Wis.....	1897
COPELAND, MANTON, 88 Federal St., Brunswick, Me.....	1900
COREY, MISS ALICE F., 1111 Park Ave., Plainfield, N. J.....	1910
COX, ULYSSES O., State Normal School, Terre Haute, Ind.....	1894
CRAIGMILE, MISS ESTHER A., 24 S. Grant St., Hinesdale, Ill.....	1910
CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.....	1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....	1891
CRANDALL, LEE S., N. Y. Zool. Park, New York City.....	1909
CRANE, MISS CLARA L., Dalton, Mass.....	1904
CRANE, MRS. ZENAS, Dalton, Mass.....	1904
CROMWELL, JAMES W., Box 246, Summit, N. J.....	1904
CROSBY, MAUNSELL S., Grasmere, Rhinebeck, N. Y.....	1904
CUMMINGS, MISS EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CURRIE, ROLLA P., Dept. of Agriculture, Washington, D. C.....	1895
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., St. Johns, Ore.....	1894
CUSHMAN, MISS ALICE, 919 Pine St., Philadelphia, Pa.....	1910
CUTLER, MRS. ANNIE F., 117 Washington Ave., Chelsea, Mass.....	1908
DANIELSON, MISS EDNA H., R. F. D. 3, Goodhue, Minn.....	1910
DART, DR. LESLIE O., Curtis Court, Minneapolis, Minn.....	1898
DAVENPORT, MRS. ELIZABETH B., Lindenhurst, Brattleboro, Vt.....	1898
DAVIS, CHARLES H., 515 Michigan Ave., Saginaw, Mich.....	1906
DAVIS, HENRY C., Cummaquid, Mass.....	1909
DAVIS, MRS. SUSAN L., 139 Park St., Newton, Mass.....	1906
DAY, CHESTER SESSIONS, 15 Chilton Road, West Roxbury, Mass.....	1897
DAY, FRANK MILES, Mt. Airy, Philadelphia, Pa.....	1901
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DELOACH, R. J. H., University of Ga., Athens, Ga.....	1910
DENNIS, DAVID W., Richmond, Ind.....	1907
DENSMORE, MISS MABEL, Red Wing, Minn.....	1910
DERBY, RICHARD, 925 Park Ave., New York City.....	1898
DERBY, W. M., Jr., 4857 Kimbark Ave., Chicago, Ill.....	1908
DERICKSON, MRS. GEO. P., 1760 Hennepin Ave., Minneapolis, Minn.....	1910
DEVINE, J. L., 5319 Woodlawn Ave., Chicago, Ill.....	1903
DEWEY, DR. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900

DEWING, THOMAS W., 82 E. 55th St., New York City.....	1907
DICE, LEE RAYMOND, Prescott, Wash.....	1909
DICKERSON, Miss MARY C., Am. Mus. Nat. History, N. Y. City.....	1908
DICKEY, DONALD R., Box 701, South Pasadena, Cal.....	1907
DICKEY, SAMUEL S., 31 S. West St., Waynesburg, Pa.....	1905
DILLE, FREDERICK M., 2927 W. 28th Ave., Denver, Colo.....	1892
DIMICK, CHAS. W., 1008 Tremont Bldg., Boston, Mass.....	1909
DIMOCK, GEO. E., Jr., 907 N. Broad St., Elizabeth, N. J.....	1911
DIONNE, C. E., Laval University, Quebec, Que.....	1893
DIXON, FREDERICK J., Elm Ave., Hackensack, N. J.....	1891
DODGE, CHARLES W., Univ. of Rochester, Rochester, N. Y.....	1900
DODSON, JOSEPH H., 534 Sheridan Road, Evanston, Ill.....	1909
DOUGHERTY, Gen. WILLIAM E., 1409 E. 14th St., Fruitvale, Cal.....	1890
DRAPER, J. SUMNER, Readville, Mass.....	1908
DROWNE, Dr. FREDERICK PEABODY, Chilesburg, Va.....	1899
DRUMMOND, Miss MARY, Spring Lane, Lake Forest, Ill.....	1904
DUBOIS, ALEX. DAWES, 320 Waldron St., West La Fayette, Ind.....	1905
DU BON, JAMES L., Windsor Locks, Conn.....	1909
DUGMORE, ARTHUR RADCLYFFE, Newfoundland, N. J.....	1899
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNBAR, W. LINFRED, Union Metallic Cartridge Co., Bridgeport, Conn.....	1906
DUNHAM, ARTHUR LOUIS, 49 Hampden Hall, Cambridge, Mass.....	1910
DUNN, Miss HARRIET A., Box 45, Athol, Mass.....	1909
DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DUYREA, Miss ANNIE B., 62 Washington St., Newark, N. J.....	1911
DWIGHT, Dr. EDWIN W., 119 Pearl St., Boston, Mass.....	1911
DYCHE, Prof. L. L., Pratt, Kansas.....	1886
DYER, Ed. T., Southampton, N. Y.....	1911
DYKE, ARTHUR CURTIS, Bridgewater, Mass.....	1902
EARLE, Miss ELEANOR P., Palma Sola, Fla.....	1910
EASTMAN, FRANCIS B., Delaware College, Newark, Del.....	1909
EASTMAN, HARRY D., Framingham, Mass.....	1891
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....	1909
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EHINGER, Dr. CLYDE E., 100 Rosedale Ave., West Chester, Pa.....	1904
EICHE, AUGUST, 1133 O St., Lincoln, Neb.....	1902
EIFRIG, Rev. C. W. GUSTAVE, Addison, Ill.....	1901
EIMBECK, Dr. A. F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, Nat. Hist. Bldg., 809 West Main St., Urbana, Ill.....	1911
ELLS, GEORGE P., Norwalk, Conn.....	1904
ELROD, Prof. MORTON J., 205 S. 5th St., Missoula, Montana.....	1892
EMBODY, GEORGE CHARLES, 324 College Ave., Ithaca, N. Y.....	1898
EMMET, CHRISTOPHER TEMPLE, Stony Brook, N. Y.....	1909
EMMET, ROBERT T., New Rochelle, N. Y.....	1904

EMORY, MRS. MARY DILLE, 156 Foundry St., Morgantown, W. Va.	1899
ELLIOTT, Dr. E. EARL, 63 William St., Lyons, N. Y.	1909
ENDERS, JOHN O., Box 546, Hartford, Conn.	1904
ESSICK, WM. S., Box 858, Reading, Pa.	1906
EUSTIS, RICHARD S., 17 Highland St., Cambridge, Mass.	1903
EVANS, Miss NEVADA, 3637 10th Ave., S., Minneapolis, Minn.	1910
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.	1897
FARLEY, JOHN A., 105 Summer St., Malden, Mass.	1904
FARR, MARCUS S., Princeton University, Princeton, N. J.	1900
FARWELL, MRS. JOHN V., Ardleigh, Lake Forest, Ill.	1896
FAY, L. H., Brocton, N. Y.	1910
FAY, S. PRESCOTT, 3 Brimmer St., Boston, Mass.	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo.	1898
FELL, Miss EMMA TREGO, 28 N. 39th St., West Philadelphia, Pa.	1903
FELTON, W. R., Box 414, Miles City, Mont.	1910
FIELD, EDWARD B., 30 Gillette St., Hartford, Conn.	1898
FIELD, Dr. GEO. W., Sharon, Mass.	1910
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa.	1896
FISHER, G. CLYDE, Johns Hopkins Univ., Baltimore, Md.	1908
FISHER, WALTER T., 52 Plympton St., Cambridge, Mass.	1907
FITTS, MRS. CAROLINE M., 29 Lakeville Place, Jamaica Plain, Mass.	1906
FLANAGAN, JOHN H., 392 Benefit St., Providence, R. I.	1898
FLETCHER, MRS. MARY E., Proctorsville, Vt.	1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.	1897
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.	1901
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.	1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.	1883
FRANCIS, GEO. A., 1453 Sea View Ave., Bridgeport, Conn.	1911
FRASER, DONALD, Johnstown, N. Y.	1902
FRAZIER, J. F., Audubon, Iowa.	1909
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.	1903
FREEMAN, Dr. LEONARD, 1374 Elizabeth St., Denver, Colo.	1909
FRENCH, CHARLES H., Canton, Mass.	1904
FRENCH, MRS. TERESA I., Canton, Mass.	1908
FUGUET, DALLETT, 229 Upper Mountain Ave., Montclair, N. J.	1911
FULLER, CLARENCE J., Elmwood Ave., Bayside, N. Y.	1907
FULLER, MRS. ELLA M., Needham, Mass.	1909
FULLER, T. OTIS, Needham, Mass.	1904
FUTCHER, Dr. THOMAS B., 23 W. Franklin St., Baltimore, Md.	1906
GANO, Miss LAURA, 744 National Road, W., Richmond, Ind.	1903
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.	1903
GARRICK, JAMES P., Jr., Weston, S. C.	1906
GATH, JOHN, Box 236, Torrington, Conn.	1901
GIBSON, LANGDON, 5 Union St., Schenectady, N. Y.	1904
GIFFORD, EDWARD WINSLOW, Cal. Acad. Sci., San Francisco, Cal.	1904

GILMAN, M. FRENCH, Sacaton, Arizona.....	1907
GIANINI, CHAS. A., Poland, N. Y.....	1911
GOODALE, DR. JOSEPH LINCOLN, 258 Beacon St., Boston, Mass.....	1885
GOODELL, MRS. JAMES P., Rhinebeck, N. Y.....	1909
GOODRICH, JULIET T., 1210 Astor St., Chicago, Ill.....	1904
GOODWIN, Miss AMELIA M., 10 Follen St., Cambridge, Mass.....	1904
GORDON, HARRY E., 313 Laburnum Ave., Rochester, N. Y.....	1911
GOULD, JOSEPH E., 5 Clifton St., Norfolk, Va.....	1889
GRAHAM, WM. J., Aledo, Ill.....	1909
GRANGER, Miss HELEN, Wilder Hall, Amherst, Mass.....	1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York City.....	1891
GRANT, WM. W., Englewood, N. J.....	1910
GRAVES, MRS. CHARLES B., 66 Franklin St., New London, Conn.....	1905
GREEN, Miss MARY AMORY, Croton-on-Hudson, N. Y.....	1911
GREENOUGH, HENRY VOSE, 23 Monmouth Court, Brookline, Mass.....	1901
GREGORY, STEPHEN S., Jr., 1349 Astor St., Chicago, Ill.....	1906
GRISCOM, LUDLOW, 21 Washington Sq., N., New York City.....	1908
GRONBERGER, S. M., Smithsonian Inst., Washington, D. C.....	1909
GROSS, ALFRED O., 391 Hyde Park Ave., Roslindale, Boston, Mass.....	1907
GUTSELL, JAMES S., Ithaca, N. Y.....	1911
HADLEY, ALDEN H., Monrovia, Indiana.....	1906
HALES, HENRY, Ridgewood, N. J.....	1890
HALL, FRANK H., Agricultural Experiment Station, Geneva, N. Y.....	1910
HALL, H. PORTER, Leominster, Mass.....	1904
HALLETT, GEO. H., Jr., 105 E. Essex Ave., Lansdowne, Pa.....	1911
HAMILTON, DR. B. A., Highland Park, Ill.....	1909
HANKINSON, THOS. LEROY, Charleston, Ill.....	1897
HARDON, MRS. HENRY W., 315 West 71st St., New York City.....	1905
HARDY, JOHN H., Jr., Littleton, Mass.....	1905
HARPER, FRANCIS, 557 First Ave., College Point, N. Y.....	1907
HARPER, MRS. MARY McC., 102 Pennsylvania Ave., Wilmington, Del.....	1910
HARRIS, HARRY, Kansas City, Mo.....	1911
HARRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1911
HART, CHARLES G., Box 47, East Berlin, Conn.....	1908
HARVEY, Miss RUTH SAWYER, Bond Hill, Cincinnati, Ohio.....	1902
HASKELL, Miss HELEN P., 1207 Henry St., Alton, Ill.....	1905
HATHAWAY, HARRY S., Box 1466, Providence, R. I.....	1897
HAVEMEYER, H. O., Jr., 129 Front St., New York City.....	1893
HAZARD, Hon. R. G., Peace Dale, R. I.....	1885
HEIL, CHARLES E., Needham, Mass.....	1908
HELME, ARTHUR H., Miller Place, N. Y.....	1888
HENDERSON, Judge JUNTUS, Boulder, Colo.....	1903
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....	1885
HENN, ARTHUR WILBUR, Indiana University, Bloomington, Ind.....	1909
HENNINGER, Rev. WALTHER F., New Bremen, Ohio.....	1898
HERRICK, HAROLD, 25 Liberty St., New York City.....	1905

HERSEY, L. J., 2121 W. 34th Ave., Denver, Colo.....	1909
HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass.....	1911
HESSE, ISAAC E., Philo, Ill.....	1909
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....	1900
HILL, JAMES HAYNES, Box 485, New London, Conn.....	1897
HILL, MRS. THOMAS R., 4629 Baltimore Ave., Philadelphia, Pa.....	1903
HINE, ASHLEY, 615 Isabella St., Edmonton, Alberta.....	1909
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio.....	1899
HINE, MRS. JANE L., Auburn, Ind.....	1890
HITCHCOCK, FRANK H., Metropolitan Club, Washington, D. C.....	1891
HIX, GEORGE E., 630 Columbus Ave., New York City.....	1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....	1899
HOLDEN, MRS. EMELINE R., 13 E. 79th St., New York City.....	1902
HOLDEN, MRS. EDWIN B., 323 Riverside Drive, New York City.....	1903
HOLLAND, HAROLD MAY, 5322 Ellis Ave., Chicago, Ill.....	1910
HOLLAND, Dr. WILLIAM J., Carnegie Institute, Pittsburgh, Pa.....	1899
HOLLISTER, WARREN D., 620 McPhee Bld'g., Denver, Colo.....	1901
HOLMAN, RALPH H., 33 Chestnut St., Stoneham, Mass.....	1907
HOLT, ERNEST F., Barachias, Ala.....	1911
HOLT, MRS. NANCY W. C., 136 Chauncey St., Cambridge, Mass.....	1908
HONYWILL, ALBERT W., Jr., 171 Ellsworth Ave., New Haven, Conn.....	1907
HORSFALL, BRUCE, Princeton, N. J.....	1905
HOWELL, A. BRAZIER, 250 N. Orange Grove Ave., Pasadena, Cal.....	1909
HOWELL, BENJAMIN F., Jr., R. F. D. 1, Boonton, N. J.....	1907
HOWE, CARLTON D., Essex Junction, Vt.....	1901
HOWE, Miss LOUISE, 53 Linden St., Brookline, Mass.....	1908
HOWE, REGINALD HEBER, Jr., Middlesex School, Concord, Mass.....	1895
HOXIE, WALTER J., 1522 Bull St., Savannah, Ga.....	1909
HOYT, Miss ANNIE S., 121 Madison Ave., New York City.....	1909
HOYT, WILLIAM H., Box 425, Stamford, Conn.....	1907
HUBBARD, Dr. LUCIUS L., Houghton, Mich.....	1907
HUBBARD, MRS. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.....	1891
HUDSON, MRS. R. W., 373 Broadway, Cambridge, Mass.....	1911
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....	1895
HUNT, CHRESWELL J., 740 S. Cuyler Ave., Oak Park, Ill.....	1902
HUTCHINSON, Dr. W. F., Box 42, Portsmouth, Va.....	1910
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., Box 843, San Diego, Cal.....	1885
IRVING, JOHN, 52 Broadway, Glen Cove, N. Y.....	1894
ISHAM, C. B., 30 E. 63d St., New York City.....	1891
JACKSON, HARTLEY H. T., Biological Survey, Washington, D. C.....	1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.....	1888
JAMES, MRS. I. M., 105 W. Court St., Doylestown, Pa.....	1909
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....	1905
JESSUP, J. M., Smithsonian Institution, Washington, D. C.....	1910
JEWEL, LINDSEY L., Gatun, Canal Zone, Panama.....	1910

JEWETT, STANLEY G., 582 Bidwell Ave., Portland, Oregon.....	1906
JEWETT, McCORMICK, 205 Yale Station, New Haven, Conn.....	1909
JOHNS, ERWIN WM., Kingsley, Arizona.....	1910
JOHNSON, Mrs. GRACE PETTIS, City Library Association, Springfield, Mass.....	1908
JOHNSON, FRANK EDGAR, 16 Amackassin Terrace, Yonkers, N. Y.....	1888
JOHNSON, JAMES HOWARD, Bradford, N. H.....	1894
JOHNSON, WALTER ADAMS, 18 Gramercy Park, New York City.....	1889
JOHNSON, WILLIAM S., Lyons, N. Y.....	1893
JOHNSTON, J. W., 5 Arnold Park, Rochester, N. Y.....	1911
JORDAN, A. H. B., Lowell, Wash.....	1888
JUDD, ELMER T., Cando, N. D.....	1895
JUMP, Mrs. EDWIN R., 350 Waltham St., West Newton, Mass.....	1910
KALMBACH, EDWIN R., Biological Survey, Washington, D. C.....	1910
KHAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....	1899
KEIM, THOMAS DANIEL, 405 Radcliffe St., Bristol, Pa.....	1902
KENDALL, H. T., Virginia, Minn.....	1911
KENNARD, FREDERIC HEDGE, Dudley Road, Newton Centre, Mass.....	1892
KENT, EDWIN C., 90 West St., New York City.....	1907
KERMODE, FRANCIS, Provincial Museum, Victoria B. C.....	1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....	1904
*KIDDER, NATHANIEL T., Milton, Mass.....	1906
KILBURN, FRANK M., 214 Stewart Ave., Ithaca, N. Y.....	1911
KILGORE, WILLIAM, Jr., 1705 4th Ave., S., Minneapolis, Minn.....	1906
KILMAN, A. H., Ridgeway, Ontario.....	1909
KING, LE ROY, 20 E. 84th St., New York City.....	1901
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....	1910
KIRKWOOD, FRANK C., Long Green, Md.....	1892
KITTREDGE, JOSEPH, Jr., 67 Cypress St., Brookline, Mass.....	1910
KLOSEMAN, Miss JESSIE E., 4 Spruce St., Dedham, Mass.....	1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....	1906
KNAPP, Mrs. HENRY A., 301 Quincy Ave., Scranton, Pa.....	1907
KNOLHOFF, FERDINAND WILLIAM, Bloomfield, N. J.....	1890
KOHLER, LOUIS SLIDELL, 98 Watsessing Ave., Bloomfield, N. J.....	1910
KREMER, ROLAND EDWARD, 1720 Vilas St., Madison, Wis.....	1909
KUSER, ANTHONY R., Bernardsville, N. J.....	1908
KUSER, Mrs. ANTHONY R., Faircourt, Bernardsville, N. J.....	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....	1910
KUTCHIN, Dr. VICTOR, Green Lake, Wis.....	1905
LACEY, HOWARD GEORGE, Kerrville, Texas.....	1899
LANCASHIRE, Mrs. JAMES HENRY, Alma, Mich.....	1909
LANE, LAWTON W., 121 Franklin St., Lynn, Mass.....	1909
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.....	1907

* Life Associate.

LANTZ, Prof. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.	1885
LARRABEE, AUSTIN P., 1540 Vassar Ave., Wichita, Kan.	1902
LATIMER, Miss CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa.	1902
LAW, J. EUGENE, Hollywood, Cal.	1907
LAWRENCE, JOHN B., 126 E. 30th St., New York City	1907
LEE, HENRY E., Rapid City S. D.	1910
LEVY, W. CHARLESWORTH, 53 Waverly St., Brookline, Mass.	1908
LEWIS, Dr. FREDERIC T., Harvard Medical School, Boston, Mass.	1909
LINCOLN, FREDERICK CHARLES, 3350 Shoshone St., Denver, Colo.	1910
LINTON, CLARENCE B., 125 West Ocean Ave., Long Beach, Cal.	1908
LOOMIS, JOHN A., Mereta, Texas.	1887
LORD, Rev. WILLIAM R., Dover, Mass.	1901
LORING, J. ALDEN, Owego, N. Y.	1889
LOW, ETHELBERT T., 30 Broad St., New York City	1907
LUM, EDWARD H., Chatham, N. J.	1904
LUTHER, CLARENCE H., 8 McIlley Bldg., Fayetteville, Ark.	1910
MACDOUGALL, GEORGE R., 112 Wall St., New York City	1890
MACKIE, Wm. C., 54 Coolidge St. Brookline, Mass.	1908
MACLAY, MARK W., Jr., 70 West 55th St., New York City	1905
MADDOCK, Miss EMELINE, The Belgravia, Philadelphia, Pa.	1897
MAHER, J. E., Windsor Locks, Conn.	1902
MAITLAND, ROBERT L., 141 Broadway New York City	1889
MARBLE, RICHARD M., 7 Keiffer St., Brookline, Mass.	1907
MARCH, Prof. JOHN LEWIS, Union College, Schenectady, N. Y.	1903
MARRE, Mrs. KINGSMILL, Saxonville, Mass.	1903
MARSDEN H. W., Witch Creek, Cal.	1904
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J.	1902
MARX, EDWARD J. F., 8 Chestnut Terrace, Easton, Pa.	1907
MAULE, GEO. C., Guin Tree, Pa.	1910
McCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.	1900
McCONNELL, HARRY B., 142 E. Warren St., Cadiz, O.	1904
McCOOK, PHILIP JAMES, 15 William St., New York City	1895
McHATTON, Dr. HENRY, Macon, Ga.	1898
McILHENNY, EDWARD AVERY Avery Island, La.	1894
McINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass.	1908
McLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va.	1893
McMILLAN, Mrs. GILBERT, 1 Mercer Circle, Cambridge, Mass.	1902
MEAD, Mrs. E. M., 2465 Broadway New York City	1904
MERRIAM, CHARLES, Weston, Mass.	1908
MERRIAM, HENRY F., 94 New England Ave., Summit, N. J.	1905
MERRILL, HARRY, Bangor, Maine.	1883
MERSON, W. B., Saginaw, Mich.	1905
MESSENGER, G. H., Linden, Iowa	1911
METCALF, WILLARD L., 33 West 67th St., New York City	1908
MILLER, CHAS. W., Shawnee-on-Delaware, Pa.	1909

MILLS, HARRY C., Box 218, Unionville, Conn.....	1897
MILLS, HERBERT R., Jacksonville, Fla.....	1911
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.....	1900
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....	1911
MITCHELL, Dr. WALTON I., 603 Beacon Bldg., Wichita, Kan.....	1893
MOORE, HENRY D., Haddonfield, N. J.....	1911
MOORE, Miss ELIZ. PUTNAM, 70 West 11th St., New York City....	1905
MOORE, ROBERT THOMAS, 46 Mansion Ave., Haddonfield, N. J.....	1898
MOORE, WILLIAM G., 257 W. Main St., Haddonfield, N. J.....	1910
MORCOM, G. FREAN, 1815 N. Raymond Ave., Pasadena, Cal.....	1886
MORGAN, ALBERT, Box 1323, Hartford, Conn.....	1903
MORLEY, G. GRISWOLD, 2375 13th St., Boulder, Colo.....	1911
MORE, R. L., Vernon, Texas.....	1911
MORRIS, SIDNEY V., Bristol, Penn.....	1911
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose, Mass.....	1905
MURPHY, Dr. EUGENE E., 444 Telfair St., Augusta, Ga.....	1903
MURPHY, ROBERT C., Brooklyn Inst. Museum, Eastern Parkway, Brooklyn, N. Y.....	1905
MUSGRAVE, JOHN K., 3516 Shady Ave., Allegheny, Pa.....	1909
MUSSELMAN, THOMAS EDGAR, Gem City Business College, Quincy, Ill.	1910
MYERS, Mrs. HARRIET W., 306 Ave. 66, Los Angeles, Cal.....	1906
MYERS, Miss LUCY F., Brookside, Poughkeepsie, N. Y.....	1898
NASH, HERMAN W., Box 284, Pueblo, Colo.....	1892
NELSON, JAMES ALLEN, Bureau of Entomology, Washington, D. C..	1898
NEWHALL, DANIEL S., Strafford, Pa.....	1908
NEWMAN, Rev. STEPHEN M., 6917 Bennett Ave., Chicago, Ill.....	1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.....	1890
NICHOLS, JOHN TREADWELL, Am. Mus. Nat. Hist., New York City..	1901
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, J. PARKER, Jr., care of Evening Bulletin, Philadelphia, Pa..	1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1904
NOVY, FRANK ORIEL, 721 Forest Ave., Ann Arbor, Mich.....	1909
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.....	1897
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis....	1897
OLDYS, HENRY, Silver Springs, Md.....	1896
*OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass.....	1900
OSBURN, PINGREE S., 189 E. Colorado St., Pasadena, Cal.....	1910
OVERTON, Dr. FRANK, Patchogue, N. Y.....	1909
OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PACKER, JESSE E., 444 S. 4th St., Darby, Pa.....	1910
PAINE, AUGUSTUS G., Jr., 18 West 49th St., New York City.....	1886
PALADIN, ARTHUR, N. Y. State Museum, Albany, N. Y.....	1911
PARKER, Mrs. BENJAMIN W., 4 Hopestill St., Dorchester Centre, Mass.	1909
PARKER, Hon. HERBERT, South Lancaster, Mass.....	1904

PARSONS, R. L., 158 Raymond Ave., South Orange, N. J.....	1911
PARSONS, WILLIAM, Box 422, Manila, P. I.....	1909
PAUL, LUCIUS H., 59 West Miller St., Newark, New York.....	1908
PEABODY, Rev. P. B., Blue Rapids, Kan.....	1903
PEARSON, LEONARD S., 132 Beechtree Lane, Wayne, Pa.....	1907
PEAVEY, ROBERT W., 791 Coney Island Ave., Brooklyn, N. Y.....	1903
PECK, MORTON E., 292 N. Summer St., Salem, Ore.....	1909
PECK, WALTER M., 15 9th St., East Providence, R. I.....	1909
PENNINGTON, FRED ALBERT, 515 Chamber of Commerce, Chicago, Ill.....	1910
PEPPER, Dr. WM., 1811 Spruce St., Philadelphia, Pa.....	1911
PERRY, Dr. ELTON, 610 Baylor St., Austin, Tex.....	1902
PERRY, HENRY JOSEPH, 636 Beacon St., Boston, Mass.....	1909
PETERS, ALBERT S., State Bank, Lake Wilson, Minn.....	1908
PETERS, JAMES LEE, Walnut Ave., Jamaica Plain, Mass.....	1904
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899
PHELPS, Mrs. MARIAN VON R., 70 West 49th St., New York City.....	1910
PHILIPP, PHILIP B., 220 Broadway, New York City.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, JOHN CHARLES, Wenham, Mass.....	1904
PIERREPONT, JOHN JAY, 1 Pierrepont Place, Brooklyn, N. Y.....	1911
PILSBURY, FRANK O., Box 592, Walpole, Mass.....	1909
PINCHOT, GIFFORD, Washington, D. C.....	1910
PITCAIRN, WILLIAM G., 3330 Perrysville Ave., Allegheny, Pa.....	1906
POB, Miss MARGARETTA, 1222 N. Charles St., Baltimore, Md.....	1899
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....	1894
POND, Miss ELLA J., 160 Lexington Ave., New York City.....	1909
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Del.....	1901
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....	1908
PORTER, LOUIS H., Stamford, Conn.....	1893
POST, Wm. S., 347 5th Ave, New York City.....	1911
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRICE, ARTHUR E., Grant Park, Ill.....	1908
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....	1893
RABORG, Wm. A., Jr., Muirkirk, Md.....	1909
RATHBORNE, R. C., Newark, N. J.....	1911
RATMOND, Mrs. C. E., 21 3d St., Hinesdale, Ill.....	1910
RANKIN, CHAS. S. G., St. George's, Bermuda.....	1909
RAWSON, CALVIN LUTHER, R. F. D. 2, Putnam, Conn.....	1885
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.....	1896
REDFIELD, ALFRED C., 56 Plympton St., Cambridge, Mass.....	1907
REDFIELD, Miss ELISA WHITNEY, 29 Everett St., Cambridge, Mass.....	1897
REED, CHESTER A., 238 Main St., Worcester, Mass.....	1904
REED, HUGH DANIEL, 108 Brandon Place, Ithaca, N. Y.....	1900
REHN, JAMES A. G., Acad. Nat. Sciences, Philadelphia, Pa.....	1901
REINBOLD, JOHN C., 576 Main St., Hackensack, N. J.....	1909

RHODES, CHARLES J., Bryn Mawr, Pa.....	1895
RICE, JAMES HENRY, Jr., Summerville, S. C.....	1910
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass....	1900
RICHARDSON, C. H., Jr., Stanford University, Cal.....	1903
RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., Maplewood, N. J.....	1885
ROBBINS, Miss ALMEDA B., Y. M. Library Association, Ware, Mass....	1910
ROBERTS, JOHN T., JR., 350 Main St., Buffalo, N. Y.....	1906
ROBERTS, WILLIAM ELY, 1920 Spring Garden St., Philadelphia, Pa....	1902
ROBERTSON, HOWARD, Los Angeles, Cal.....	1911
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....	1903
ROBINSON, LEWIS W., Cresskill, N. J.....	1910
ROBINSON, Dr. PHILIP E., 102 Huntington Ave., Boston, Mass.....	1908
*ROGERS, CHARLES H., 5 W. 82d St., New York City.....	1904
ROLFE, ALFRED G., High School, Pottstown, Pa.....	1909
ROLFE, Mrs. PERCIVAL B., 98 State St., Portland, Me.....	1909
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROPER, KENYON, Steubenville, Ohio.....	1911
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROSSIGNOL, GILBERT R., Jr., 2116 Bull St., Savannah, Ga.....	1909
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal.....	1889
SACKETT, CLARENCE, Rye, N. Y.....	1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SALLEY, FITZHUGH, Charleston Museum, Charleston, S. C.....	1907
SALTONSTALL, JOHN LEE, Beverley, Mass.....	1909
SANBORN, C. C., Highland Park, Ill.....	1911
SANFORD, HARRISON, Litchfield, Conn.....	1905
SASS, HERBERT RAVENEL, 23 Legare St., Charleston, S. C.....	1906
SAUNDERS, ARETAS A., Forest Service, Anaconda, Mont.....	1907
SAUVOLA, AUGUSTUS E., Chassell, Mich.....	1909
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....	1895
SAVAGE, WALTER GILES, Delight, Ark.....	1898
SCHANTZ, ORPHEUS M., 5215 W. 24th St., Cicero, Ill.....	1907
SCHMIDT, WALDO, U. S. S. S. "Albatross," Pacific Sta. via San Francisco, Cal.....	1910
SCHMUCKER, Dr. S. C., Rosedale Ave., West Chester, Pa.....	1903
SCHWEDER, ARTHUR, 184 Upper Mountain Ave., Montclair, N. J....	1911
SCOTT, HENRY R., 6 Charles River Sq., Boston, Mass.....	1909
SEISS, COVINGTON FEW, 1338 Spring Garden St., Philadelphia, Pa....	1898
SHANNON, Wm. PURDY, 1170 Broadway, New York City.....	1908
SHARPLES, ROBERT P., West Chester, Pa.....	1907
SHAW, WILLIAM T., 600 Linden Ave., Pullman, Wash.....	1906
SHEARER, AMON R., Mont Belvieu, Tex.....	1905
SHELDON, CHARLES, 140 W. 57th St., New York City.....	1911

SHELTON, ALFRED, R. F. D. 1, Petaluma, Cal.....	1911
*SHERMAN, Miss ALTHEA R., National, Iowa.....	1907
SHIRAS, GEORGE, 3d, Stoneleigh Court, Washington, D. C.....	1907
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....	1910
SHOEMAKER, FRANK H., 206 Nebraska Hall, Station A, Lincoln, Neb.....	1895
SHORE, EDWIN W., 191 Campbell St., New Bedford, Mass.....	1909
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SILLIMAN, HARPER, 4 Gramercy Park, New York City.....	1902
SIMMONS, GEO. F., 701 Holman Ave., Houston, Texas.....	1910
SINCLAIR, JOHN ABBOTT, New Hampton, N. H.....	1909
SMALL, Capt. H. W., 212 N. Market St., Staunton, Va.....	1911
SMITH, AUSTIN PAUL, Box 141, Brownsville, Texas.....	1911
SMITH, BYRON L., 2140 Prairie Ave., Chicago, Ill.....	1906
SMITH, Miss ETHEL M., 318 Strong Ave., Stevens Point, Wis.....	1910
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y.....	1903
SMITH, Prof. FRANK, Univ. of Ill., Urbana, Ill.....	1909
SMITH, HORACE G., Historical and Nat. Hist. Society, Denver, Colo.....	1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C.....	1886
SMITH, JESSE L., 141 South 2nd St., Highland Park, Ill.....	1907
SMITH, LOUIS IRVIN, Jr., 3809 Chestnut St., Philadelphia, Pa.....	1901
SMITH, MYRTON T., 308 Pearl St., Hartford, Conn.....	1909
SMITH, Mrs. RUTH COOK, Woodcliffe Lake, N. J.....	1909
SMITH, WILBUR F., 198 Ely Ave., South Norwalk, Conn.....	1909
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va.....	1892
SNYDER, WILL EDWIN, R. F. D. 6, Beaver Dam, Wis.....	1895
SOULE, Mrs. ETTA RICH, 11 Centre St., Watertown, Mass.....	1909
SPAULDING, FRED B., Lancaster, N. H.....	1894
SPELMAN, HENRY M., 48 Brewster St., Cambridge Mass.....	1911
STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....	1883
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....	1909
STEELE, JOHN H., Flemington, N. J.....	1906
STEPHENS, T. C., Morningside College, Sioux City, Iowa.....	1909
STEVENS, Dr. J. F., Box 546, Lincoln, Neb.....	1908
STILES, EDGAR C., 345 Main St., West Haven, Conn.....	1907
ST. JOHN, ED. PORTER, 1566 Broad St., Hartford, Conn.....	1911
STOCKBRIDGE, C. A., Fort Wayne, Ind.....	1911
STONE, CLARENCE F., Branchport, N. Y.....	1903
STONE, Wm. D., Fayetteville, Ark.....	1911
STRATER, Mrs. Wm. E., 1114 3d St., Louisville, Ky.....	1910
STRATTON-PORTER, Mrs. GENE, Limberlost Cabin, Geneva, Ind.....	1906
STRECKER, JOHN KERN, Jr., Baylor Univ., Waco, Texas.....	1909
STREET, J. FLETCHER, Beverly, N. J.....	1908
STRODE, W. S., LEWISTON. Ill.....	1911
STURGIS, S. WARREN, Groton, Mass.....	1910

STUART, Miss KATHARINE H., 719 King St., Alexandria, Va.....	1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....	1896
STYER, Mrs. KATHARINE R., Concordville, Pa.....	1903
SUMNER, Mrs. GRAHAM, Englewood, N. J.....	1910
SURFACE, Prof. HARVEY ADAM, State Zoölogist, Harrisburg, Pa.....	1897
SWAIN, JOHN MERTON, Box 142, Farmington, Me.....	1899
SWEET, EDMUND H., Sturgis, S. D.....	1910
SWENK, MYRON H., 3028 Start Street, Lincoln, Neb.....	1904
SWEZEY, GEORGE, 855 S. 15th St., Newark, N. J.....	1901
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.....	1907
TAYLOR, B. F., Columbia, S. C.....	1911
TAYLOR, W. P., Univ. of California, Berkeley, Cal.....	1911
TERRILL, LEWIS McL., 354 Elm Ave., Westmount, Quebec.....	1907
TEST, CHARLES DARWIN, Golden, Col.....	1906
TEST, Dr. FREDERICK CLEVELAND, 4620 Greenwood Ave., Chicago, Ill.....	1892
TEST, LOUIS AGASSIZ, Rolla, Mo.....	1908
THOMAS, Miss EMILY HINDS, 2000 Spruce St., Philadelphia, Pa.....	1901
THOMPSON, CHAS. S., 2018 Oxley St., South Pasadena, Cal.....	1909
THORNE, SAMUEL, 914 5th Ave., New York City.....	1908
TILLEY, GEO. D., Darien, Conn.....	1910
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.....	1907
TOPPAN, GEORGE L., 672 Graceland Ave., Chicago, Ill.....	1886
TOWER, Mrs. KATE DENIG, 9 Newbury St., Boston, Mass.....	1908
TOWNSEND, WILMOT, 272 75th St., Brooklyn, N. Y.....	1894
TREGANZA, A. O., 610 Utah Savings & Trust Bldg., Salt Lake City, Utah.....	1906
TRIPPE, THOMAS M., Howardsville, Colo.....	1909
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....	1899
TRUMBULL, J. H., Plainville, Conn.....	1907
TUDBURY, WARREN C., 8 Mall St., Salem, Mass.....	1903
TUFTS, LE ROY MELVILLE, Thrushwood, Farmington, Me.....	1903
TUFTS, Miss MARY I., 163 Lewis St., Lynn, Mass.....	1910
TUTTLE, Dr. ALBERT H., 1069 Boylston St., Boston, Mass.....	1908
TUTTLE, Dr. CARL, Berlin Heights, Ohio.....	1890
TUTTLE, HENRY EMERSON, 253 Yale Station, New Haven, Conn.....	1909
TWEEDY, EDGAR, 13 Fairview Ave., Danbury, Conn.....	1902
ULRICH, ALBERT GEORGE, 3307 Washington Ave., St. Louis, Mo.....	1909
UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.....	1900
UPHAM, Mrs. WILLIAM H., 212 3rd Ave., Marshfield, Wis.....	1907
VALENTINE, Miss ANNA J., Bellefonte, Pa.....	1905
VALENTINE, Miss LUCY W., 2 Trowbridge Terrace, Cambridge, Mass.....	1908
VAN BEUREN, Miss LOUISE, 21 W. 14th St., New York City.....	1909
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....	1885
VAN NAME, WILLARD GIBBS, N. Y. State Museum, Albany, N. Y.....	1900

VAN SANT, Miss ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....	1896
VANTASSELL, F. L., 116 High St., Passaic, N. J.....	1907
VARICK, Mrs. WILLIAM REMSEN, 1015 Chestnut St., Manchester, N. H.....	1900
VETTER, Dr. CHARLES, 10 East 92d St., New York City.....	1898
VICTOR, Dr. ED. W., 166 St. James Place, Brooklyn, N. Y.....	1911
VISHER, STEPHEN S., Vermilion, S. D.....	1904
VON LINGERKE, JUSTUS, 200 Fifth Ave., New York City.....	1907
VON ROSSEM, ADRIAN, 223 N. Orange Grove, Pasadena, Cal.....	1908
VROOMAN, ISAAC H., Jr., 282 Hamilton St., Albany, N. Y.....	1908
WADSWORTH, CLARENCE S., 37 Washington St., Middletown, Conn.....	1906
WALES, EDWARD H., Hyde Park, N. Y.....	1896
WALES, Miss ELLA, 186 Columbia Road, Dorchester, Mass.....	1908
WALKER, CURTIS H., University of Chicago, Chicago, Ill.....	1910
WALKER, ERNEST P., Paradox, Colo.....	1911
WALKER, GEO. R., R. F. D. 3, Murray, Utah.....	1909
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....	1888
WALLACE, Dr. A. H., 204 Bellevue Ave., Upper Montclair, N. J.....	1907
WALLACE, JAMES S., 69 Front St., Toronto, Ontario.....	1907
WALTER, Dr. HERBERT E., 53 Arlington Ave., Providence, R. I.....	1901
WALTERS, FRANK, South Sandisfield, Mass.....	1902
WARD, FRANK HAWLEY, 12 Grove Place, Rochester, N. Y.....	1908
WARD, HENRY L., 882 Hackett Ave., Milwaukee, Wis.....	1906
WARD, Mrs. MARTHA E., 25 Arlington St., Lynn, Mass.....	1909
WARNER, EDWARD P., Concord, Mass.....	1910
WARNER, GOODWIN, 920 Center St., Jamaica Plain, Mass.....	1908
WEBER, J. A., Box 216, Palisades Park, N. J.....	1907
WEIR, J. ALDEN, 471 Park Ave., New York City.....	1899
WELLMAN, GORDON B., 54 Beltran St., Malden, Mass.....	1908
WELLS, CHAS. S., Elwyn, Pa.....	1911
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....	1902
WENTWORTH, IRVING H., Matchuala, S. L. P., Mexico.....	1900
WETMORE, ALEXANDER, care of Museum, Lawrence, Kansas.....	1908
WETMORE, Mrs. EDMUND, 343 Lexington Ave., New York City.....	1902
WEYGANDT, CORNELIUS, Wissahickon Ave., Mt. Airy, Philadelphia, Pa.....	1907
WHARTON, WILLIAM P., Groton, Mass.....	1907
WHEELER, EDMUND JACOB, 177 Pequot Ave., New London, Conn.....	1898
WHELOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill.....	1902
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ontario.....	1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....	1902
WHITE, W. C., CHESTER, S. C.....	1911
WICKERSHAM, CORNELIUS W., Cedarhurst, N. Y.....	1902
WIKEL, HENRY H., Manual Training High School, Brooklyn, N. Y.....	1909
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, Miss ALICE W., 165 Prospect St., Providence, R. I.....	1908
WILCOX, T. FERDINAND, 115 W. 75th St., New York City.....	1895

WILDE, MARK L. C., 311 N. 5th St., Camden, N. J.....	1893
WILLARD, BERTEL G., Box 107, Millis, Mass.....	1906
WILLARD, FRANK C., Tombstone, Arizona.....	1909
WILLETT, VICTOR JOHN AUSTIN, Wydecombe, Whiteman's Creek, B. C.....	1909
WILLIAMS, HARRY C., 5344 Cabanne Ave., St. Louis, Mo.....	1908
WILLIAMS, ROBERT S., New York Botanical Gardens, Bronx Park, New York City.....	1888
WILLIAMS, ROBERT W., Jr., Tallahassee, Fla.....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILLISTON, Mrs. S., 577 Belmont St., Belmont, Mass.....	1911
WILSON, SIDNEY S., 219 S. 12th St., St. Joseph, Mo.....	1895
WINDLE, FRANCIS, 253 Dean St., West Chester, Pa.....	1909
WISE, Miss HELEN D., 1514 13th St., N. W., Washington, D. C.....	1910
WITHERBEE, Mrs. F. B., 106 Berkeley St., West Newton, Mass.....	1906
WOOD, Mrs. GEO., 1313 Spruce St., Philadelphia, Pa.....	1910
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C.....	1895
WOOD, NORMAN A., 1216 South University Ave., Ann Arbor, Mich.....	1904
WOODCOCK, ARTHUR ROY, Corvallis, Ore.....	1901
WOODRUFF, FRANK M., 225 Wisconsin St., Chicago, Ill.....	1904
WOODRUFF, LEWIS B., 24 Broad St., New York City.....	1886
WORCESTER, Mrs. ALFRED, Bacon St., Waltham, Mass.....	1908
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y.....	1889
WRIGHT, ALBERT H., 115 Stewart Ave., Ithaca, N. Y.....	1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich.....	1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass.....	1902
WRIGHT, HOWARD W., 830 N. Orange Grove Ave., Pasadena, Cal.....	1907
WRIGHT, SAMUEL, Conshohocken, Pa.....	1895
WYMAN, LUTHER E., R. F. D. 3, Nampa, Idaho.....	1907
YOUNG, Miss H. F., Maple & Monroe Sts., Hinsdale, Ill.....	1911
YOUNG, JOHN A., 371 Dundas St., London, Ontario.....	1907
YOUNG, JNO. P., 1510 5th Ave., Youngstown, Ohio.....	1911
ZAPPEY, WALTER R., 25 Rindgefield St., North Cambridge, Mass.....	1905
ZIMMER, J. T., 42d and Holdridge Sts., Lincoln, Neb.....	1908

DECEASED MEMBERS.

FELLOWS.

	<i>Date of Death</i>
ALDRICH, CHARLES.....	March 8, 1908
BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BENDIRE CHARLES EMIL.....	Feb. 4, 1897
COUES, ELLIOTT.....	Dec. 25, 1899
GOSS, NATHANIEL STICKNEY.....	March 10, 1891
HOLDER, JOSEPH BASSETT.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MERRILL, JAMES CUSHING.....	Oct. 27, 1902
PURDIE, HENRY AUGUSTUS.....	March 29, 1911
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN MAYNARD.....	Jan. 28, 1887

HONORARY FELLOWS.

BLANFORD, WILLIAM THOMAS.....	June 23, 1905
BOCAGE, J. V. BARBOZA DU.....	July —, 1908
BURMEISTER, HERMANN.....	May 1, 1892
CABANIS, JEAN.....	Feb. 20, 1906
GÄTKE, HEINRICH.....	Jan. 1, 1897
GIGLIOLI, HENRY HILLYER.....	Dec. 14, 1909
GUNDLACH, JUAN.....	March 14, 1896
GURNEY, JOHN HENRY.....	April 20, 1890
HARTLAUB, GUSTAV.....	Nov. 20, 1900
HUXLEY, THOMAS HENRY.....	June 29, 1890
KRAUS, FERDINAND.....	Sept. 15, 1895
LAWRENCE, GEORGE NEWBOLD.....	Jan. 17, 1895
MEYER, ADOLF BERNARD.....	Feb. 5, 1911
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900
NEWTON, ALFRED.....	June 7, 1907
PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SAUNDERS, HOWARD.....	Oct. 20, 1907
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SEEROHM, HENRY.....	Nov. 26, 1895
SHARPE, RICHARD BOWDLER.....	Dec. 25, 1909
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.....	Jan. 1, 1900
ANDERSON, JOHN.....	Aug. 16, 1900
BALDAMUS, EDUARD.....	Oct. 30, 1893
BLAKISTON, THOMAS WRIGHT.....	Oct. 15, 1891
BLASIUS, RUDOLPH.....	Sept. 21, 1907
BOGDANOW, MODEST NIKOLAEVICH.....	March 4, 1888
BRYANT, WALTER E.....	May 21, 1905
BULLER, WALTER LAWRY.....	July 19, 1906
COOPER, JAMES GRAHAM.....	July 19, 1902
CORDEAUX, JOHN.....	Aug. 1, 1899
DAVID, ARMAND.....	Nov. 10, 1900
FATIO, VICTOR.....	March 19, 1906
HAAST, JULIUS VON.....	Aug. 15, 1887
HARGITT, EDWARD.....	March 19, 1895
HAYEK, GUSTAV EDLER VON.....	Jan. 9, 1911
HOLUB, EMIL.....	Feb. 21, 1902
HOMER, EUGEN FERDINAND VON.....	May 31, 1889
LATARD, EDGAR LEOPOLD.....	Jan. 1, 1900
LEVERKÜHN, PAUL.....	Dec. 5, 1905
LYTTLETON, THOMAS LORD LILFORD.....	June 17, 1896
MARSCHALL, AUGUST FRIEDRICH.....	Oct. 11, 1887
MALMGREN, ANDERS JOHAN.....	April 12, 1897
MIDDENDORFF, ALEXANDER THEODORE VON.....	Jan. 28, 1894
MOSJISOVICS, FELIX G. HERMANN AUGUST.....	Aug. 27, 1897
OATES, EUGENE WILLIAM.....	Nov. 16, 1911
OUSTALET, EMILE.....	Oct. 23, 1905
PHILIPPI, R. A.....	Aug. —, 1904
PREJEVASKI, NICOLAS MICHAELOVICH.....	Oct. 20, 1887
PRENTISS, DANIEL WEBSTER.....	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888
RADDE, GUSTAV FERDINAND.....	— 1903
SCHRENCK, LEOPOLD VON.....	Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE.....	Dec. 11, 1900
SEVERTZNOW, NICOLAI ALEKSEWICH.....	Feb. 8, 1885
SHELLEY, GEORGE ERNEST.....	Nov. 29, 1910
STEVENSON, HENRY.....	Aug. 18, 1888
TRISTRAM, H. B.....	March 8, 1906
WHARTON, HENRY T.....	Sept. —, 1895
WOODHOUSE, SAMUEL W.....	Oct. 23, 1904

Deceased Members.

XXIV

MEMBERS.

FANNIN, JOHN.....	June 20, 1904
HARDY, MANLY.....	Dec. 9, 1910
JUDD, SYLVESTER DWIGHT.....	Oct. 22, 1905
RALPH, WILLIAM LEGRANGE.....	July 8, 1907
WHITMAN, CHARLES OTIS.....	Dec. 6, 1910

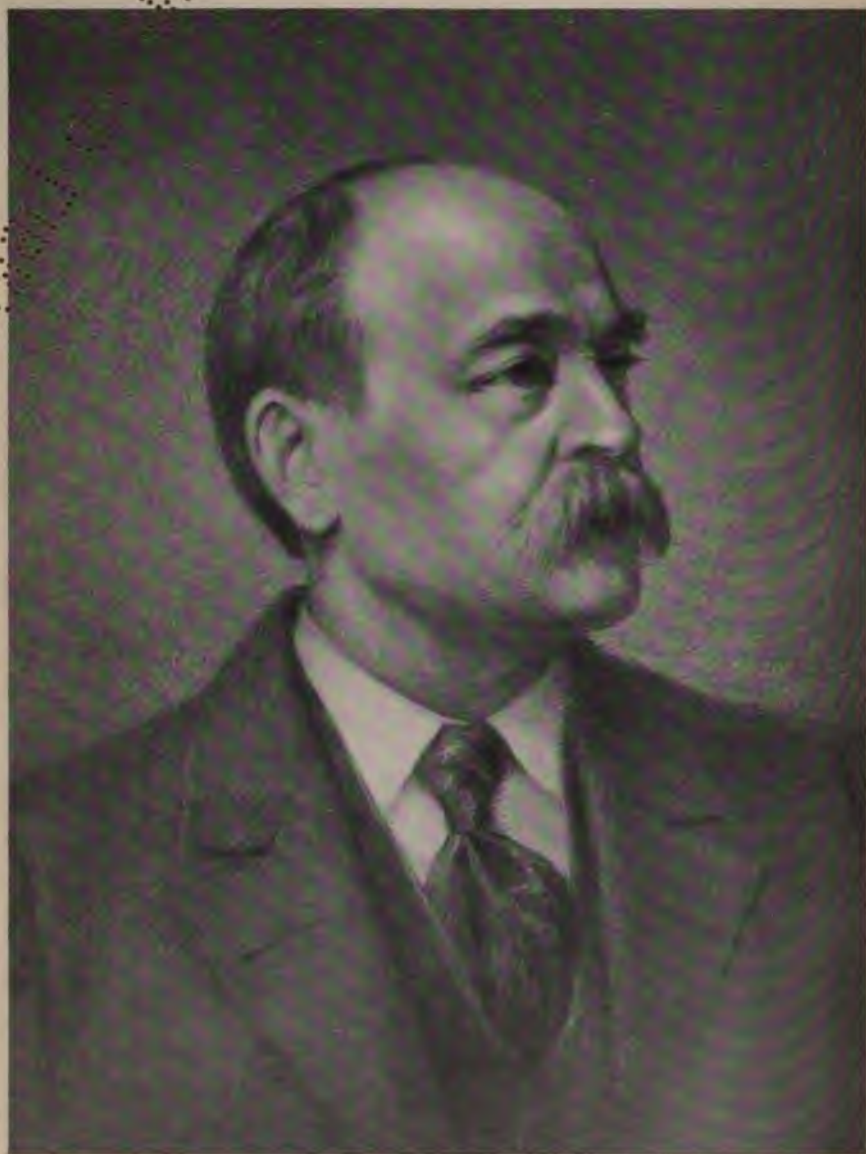
ASSOCIATES.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ANTES, FRANK T.....	Feb. 6, 1907
ATKINS, HARMON ALBRO.....	May 19, 1885
AVERY, WILLIAM CUSHMAN.....	March 11, 1894
BAILEY, CHARLES E.....	—, 1905
BARLOW, CHESTER.....	Nov. 6, 1902
BAUR, GEORGE.....	June 25, 1898
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BILL, CHARLES.....	April —, 1897
BIRTWELL, FRANCIS JOSEPH.....	June 29, 1901
BOARDMAN, GEORGE AUGUSTUS.....	Jan. 11, 1901
BOLLES, FRANK.....	Jan. 10, 1894
BRACKETT, FOSTER H.....	Jan. 5, 1900
BREESE, WILLIAM LAWRENCE.....	Dec. 7, 1889
BRENINGER, GEORGE FRANK.....	Dec. 3, 1905
BRENNAN, CHARLES F.....	Mar. 21, 1907
BROKAW, LOUIS W.....	Sept. 3, 1897
BROWN, JOHN CLIFFORD.....	Jan. 16, 1901
BROWNE, FRANCIS CHARLES.....	Jan. 9, 1900
BROWNSON, W. H.....	Sept. 6, 1909
BURNETT, LEONARD E.....	March 16, 1904
CAIRNS, JOHN S.....	June 10, 1895
CALL, AUBREY BRENDON.....	Nov. 20, 1901
CAMPBELL, ROBERT ARGYLL.....	April —, 1897
CANFIELD, J. B.....	Feb. 18, 1904
CARLETON, CYRUS.....	Nov. 15, 1907
CARTER, EDWIN.....	— 1900
CARTER, ISABEL PADDOCK.....	Sept. 15, 1907
CHADBOURNE, MRS. ARTHUR PATTERSON.....	Oct. 4, 1908
CHARLES, FRED LEMAR.....	May 6, 1911
CLARK, JOHN NATHANIEL.....	Jan. 13, 1903
COE, W. W.....	April 26, 1885
COLBURN, WILLIAM W.....	Oct. 17, 1899

COLLETT, ALONSO M.....	Aug. 22, 1902
CONANT, MRS. THOS. O.....	Dec. 28, 1907
CORNING, ERASTUS, JR.....	April 9, 1893
DAFFIN, WM. H.....	April 21, 1902
DAKIN, JOHN ALLEN.....	Feb. 21, 1900
DAVIS, WALTER R.....	April 8, 1907
DEXTER, NEWTON.....	July 27, 1901
DODGE, JULIAN MONTGOMERY.....	Nov. 23, 1909
ELLIOTT, SAMUEL LOWELL.....	Feb. 11, 1889
FAIRBANKS, FRANKLIN.....	April 24, 1895
FERRY, JOHN FARWELL.....	Feb. 11, 1910
FISHER WM. HUBBELL.....	Oct. 6, 1909
FOWLER, JOSHUA LOUNSBURY.....	July 11, 1899
FULLER, CHARLES ANTHONY.....	Mar. 16, 1906
GESNER, ABRAHAM HERBERT.....	April 30, 1895
GOSS, BENJAMIN FRANKLIN.....	July 6, 1893
HATCH, JESSE MAURICE.....	May 1, 1898
HOADLEY, FREDERICK HODGES.....	Feb. 26, 1895
HOLMES, LARUE KLINGLE.....	May 10, 1906
HOOPES, JOSIAH.....	Jan. 16, 1904
HOWLAND, JOHN SNOWDON.....	Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON.....	Oct. 2, 1898
JENKS, JOHN WHIPPLE POTTER.....	Sept. 27, 1894
JESURUN, MORTIMER.....	March —, 1905
JOUY, PIERRE LOUIS.....	March 22, 1894
KELKER, WM. A.....	Feb. 15, 1908
KNIGHT, WILBUR CLINTON.....	July 8, 1903
KNOX, JOHN C.....	July 9, 1904
KNOX, JOHN COWING.....	June 1, 1904
KOCH, AUGUST.....	Feb. 15, 1907
KUMLIEN, LUDWIG.....	Dec. 4, 1902
KUMLIEN, THURE.....	Aug. 5, 1888
LAWRENCE, ROBERT HOE.....	April 27, 1897
LEE, LESLIE ALEXANDER.....	May 20, 1908
LINDEN, CHARLES.....	Feb. 3, 1888
LLOYD, ANDREW JAMES.....	June 14, 1906
MABBETT, GIDEON.....	Aug. 15, 1900
MAITLAND, ALEXANDER.....	Oct. 25, 1907
MARBLE, CHARLES C.....	Sept. 25, 1900
MARCY, OLIVER.....	March 19, 1899
MARIS, WILLARD LORRAINE.....	Dec. 11, 1895
MCEWEN, DANIEL C.....	Nov. 1, 1909
McKINLAY, JAMES.....	Nov. 1, 1899
MEAD, GEORGE SMITH.....	June 19, 1901
MINOT, HENRY DAVIS.....	Nov. 13, 1890
MORRELL, CLARENCE HENRY.....	July 15, 1902

NICHOLS, HOWARD GARDNER.....	June 23, 1896
NIMS, LEE.....	March 12, 1903
NORTROP, JOHN I.....	June 26, 1891
PADDOCK, ISABEL M.....	Sept. 15, 1907
PARK, AUSTIN F.....	Sept. 22, 1893
PAULMIER, FREDERICK CLARK.....	March 3, 1906
POMROY, GRACE V.....	May 14, 1906
RAGSDALE, GEORGE HENRY.....	March 25, 1895
READY, GEORGE H.....	March 20, 1903
RAWLE, FRANCIS WILLIAM.....	June 12, 1911
RICHARDSON, JENNESS.....	June 24, 1893
ROBINS, MRS. EDWARD.....	July 2, 1906
SAND, ISABELLA LOW.....	April 20, 1906
SELOUS, PERCY SHERBORN.....	April 7, 1900
SLATER, JAMES H.....	Feb. —, 1895
SLEVIN, THOMAS EDWARDS.....	Dec. 23, 1902
SMALL, EDGAR ALBERT.....	April 24, 1884
SMITH, CLARENCE ALBERT.....	May 6, 1896
SNOW, FRANCIS HUNTINGTON.....	Sept. 20, 1908
SOUTHWICK, JAMES MORTIMER.....	June 3, 1904
STOWE, W. H.....	March —, 1895
SWEIGER, MRS. J. L.....	March 23, 1907
TAYLOR, ALEX. O'DRISCOLL.....	April 10, 1910
THOMPSON, MILLET T.....	Aug. 7, 1907
THORNE, PLATTE MARVIN.....	March 16, 1897
THURBER, EUGENE CARLETON.....	Sept. 6, 1896
VENNOR, HENRY GEORGE.....	June 8, 1884
WATERS, EDWARD STANLEY.....	Dec. 26, 1902
WILLARD, SAMUEL WELLS.....	May 24, 1887
WISTER, WILLIAM ROTCH.....	Aug. 21, 1911
WOOD, WILLIAM.....	Aug. 9, 1885
WOODRUFF, EDWARD SEYMOUR.....	Jan. 15, 1909
WORTHEN, CHARLES K.....	May 27, 1909
YOUNG, CURTIS CLAY.....	July 30, 1902

STANDARD



*Very sincerely yours,
H. A. Purdie.*

THE AUK:

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JANUARY, 1912.

No. 1.

IN MEMORIAM: HENRY AUGUSTUS PURDIE.

Born December 16, 1840 — Died March 29, 1911.

BY WILLIAM BREWSTER.

Plate I.¹

HENRY AUGUSTUS PURDIE was born on the sixteenth of December, 1840, in Beñijah, Asia Minor, a suburban town about five miles to the eastward of Smyrna. He died in Boston, Massachusetts, on the twenty-ninth of March, 1911. His father, John Purdie, was Scotch, although born (in 1803) in London, and reared there, his father being employed in the Bank of England. After his marriage John Purdie served as British Consul at Adalia on the southeast coast of Asia Minor, where he died in 1856. Henry's mother, Eleanor (Pratt) Purdie, was descended from old New England stock and born in Charlestown, Massachusetts, in 1808. Her father, John Pratt, was a merchant captain and a partner of Judah Truro of Boston.

In 1842 Henry Purdie, with his mother and his elder brother Alfred, came in a sailing vessel from Smyrna to Boston where, and at Billerica (Massachusetts), he spent the next two or three years. He was then, as certain of his friends and relatives still remember, a beautiful and interesting child, active, graceful, gentle, easily winning the affection of those about him and attracting much attention during his walks abroad, when he was usually dressed in plaid kilts and black velvet jacket, and accompanied by his Greek

¹ From a crayon sketch by Miss Evelyn Purdie, based on recent photographs.

nurse, a strikingly handsome woman. In 1845 he returned with his mother and brother to the Levant, where the family were reunited at Adalia. Here the conditions of life were such that the Purdie children had to spend most of their time in the house and in a large yard and garden connected with it which served them well as a playground; but on Sundays, after listening to a Church of England service and to a Unitarian discourse, they were accustomed to walk out into the country beyond the city walls accompanied by a servant and two or three janizaries to keep off the rabble of hooting native children who followed them and to carry their lunch, which was commonly eaten beside an iris-lined brook, or in an olive grove, or beneath some spreading plane tree. Such an excursion might end in an exciting climb down precipitous limestone cliffs, over which brooks cascaded into the sea, on reaching which the children would be met by a boat sent there to bring them home. Sometimes they were rowed into romantic-looking caves abounding with wild birds, or to pebbly beaches fringed with oleanders, where they bathed. When confined to the house they often amused themselves by cutting pictures from the 'Illustrated London News' and throwing them from an overhanging window into the street, where a crowd of Turkish or Greek boys would soon assemble to scramble over one another for them. Towards evening they usually resorted to the kiosk on top of the house whence one might look out over red-tiled roofs and gardens of orange, lemon, fig, vine and mulberry to the blue sea, beyond which rose lofty ranges of mountains bounding the Bay of Pamphilia.

In the summer of 1846 the family traveled with a caravan to Buldur, a remote Turkish village among the Taurus mountains about a hundred miles from the seacoast. During this journey each of the children occupied a box supplied with bedding and a canopy and slung on the side of a large mule. They, with their mother and a Greek maid, passed the entire summer at Buldur away from all European civilization. They were well treated by the village children, who were more polite and friendly than those at Adalia. In the afternoon they would walk to a large salt lake near at hand, or to some garden or vineyard where they gathered fruit while the attendant servant told them wonderful stories.

It is to Alfred Purdie, chiefly, that I am indebted for knowledge of these early experiences of the brothers in Asia Minor. Henry

recalled them only dimly in after years, although he often spoke of them in general terms, and occasionally the fragrance of an iris or the sound of a rushing brook would prompt him to exclaim, "This reminds me of Adalia." His mother taught him his letters there. After leaving Adalia he and his brother were for some months at a school kept by an American lady in Bonabat near Smyrna, and later Henry was sent to a higher grade English school in the same village.

In 1852 Henry Purdie came again to Boston with his mother. The next year the family, with the exception of the father, who remained at Adalia, were living in West Newton, where Henry attended the Model School. In 1854 he was one of the first pupils at the English and Classical School, conducted by the late Nathaniel T. Allen. After leaving the latter school he went to one kept by a Mr. Tower in the basement of Park Street Church. During the period just referred to, he and his brother Alfred spent much of their leisure time in boating or swimming in Charles River — a lonely stream in those days, in tracing brooks to their sources, in climbing hills, and in wandering through remote woodlands. They made the usual boys' collections of minerals, shells and other "curios," among which was a huge hornet's nest, secured by rising at three o'clock one summer morning and walking over Weston Bridge to the foot of Doublet Hill where the prize was found in some scrub growth and its rightful owners smoked out with fumes of sulphur.

As a boy, Henry was not unlike other lads of his own age, except that he was more gentle than most, never indulging in wanton or thoughtless cruelty to any living creature. He was fond of pets, but had little opportunity to indulge his love for them. When about fourteen years of age, he began a series of chemical experiments in connection with which he had advice from his cousin, the late Professor J. P. Cook. Apparently his taste for them was soon replaced by the deeper and more lasting interest which so dominated his after life, viz., that in ornithology, for by 1858, as his brother Alfred is fortunately able to remember definitely, he had already begun to devote himself to it and to collect the nests and eggs of Massachusetts birds.

Henry's first venture for a living, after some preliminary work

in a machine shop, which he did not like, was in Boston, about 1859, as a clerk with Lemme, Price & Company, manufacturing jewelers. After the dissolution of this firm, he was for about a month similarly employed by Shreve, Crump & Low. The Civil War being then well under way, he, with two of his friends, in February, 1862, enlisted in the navy, serving for over a year as yeoman, having charge of guns and ammunition on the U. S. barque 'James L. Davis' of the Gulf blockading squadron. The life, as it appears in his journals, was not very eventful or exciting except when, as occasionally happened, a blockade runner was pursued and captured. Whenever the men went ashore to forage for supplies and he accompanied them, he seems to have given his attention chiefly to observing birds, sometimes collecting a few eggs. He had two or three warm friends aboard the vessel, but most of his associates were uncongenial, and the constant discipline and routine of naval life were very irksome to him, while he was rarely free from seasickness. In the spring of 1863, he obtained his discharge and returned to Boston, where he soon found employment at the State House in the office of the Massachusetts State Board of Charities, under Mr. Frank B. Sanborn. Here he performed clerical work and visited, inspected and reported on, various State institutions, such as almshouses, asylums, etc. He continued to hold this position for about thirty-five years. After retiring from it in 1898, he greatly enjoyed his well-earned freedom and the opportunities it brought for indulging in the study of ornithology, botany and nature, to which he devoted himself during the remainder of his life. Living with his sister in a quiet side street on Beacon Hill, he had not far to go to reach his favorite reading haunts, the Boston Athenæum and Public Libraries, in one or another of which he might be found at almost any hour of the day or evening, especially in winter, poring over some book or pamphlet relating to birds or plants. Being a diligent and methodical student of all such literature past and present, he kept himself intimately informed respecting it and apparently derived from it quite as much pleasure and satisfaction as he did from the acquisition of first-hand knowledge obtained in woods and fields. The latter were not neglected, of course. On the contrary, he visited them frequently in all seasons, and sometimes almost

daily in spring, summer and autumn, going to them quite as often alone as with companions, for, like all sincere lovers of nature, he had no aversion to solitary walks. During this period, his hearing, once acute and discriminating, became duller and duller until only the loudest bird songs, coming from very near at hand, attracted his notice. His eyesight, never of the best, was steadily failing too. Largely because of these unfortunate and ever-increasing disabilities, he turned his attention more and more from birds to plants, until the latter came to absorb the greater part of it, at least whenever he went afield, filling him with fresh enthusiasm and interest, and bringing him into intimate relations with new friends. Yet the old ornithological interests and friendships were never laid aside or neglected wherever it was possible to maintain them. With the plant life about Boston he became, in the course of only a few years, surprisingly familiar. Many a rare or locally-restricted species was ferreted out by him, often where its presence had hitherto been unknown, if not quite unsuspected. There were certain individual living plants or restricted groups of them to which he especially devoted himself, visiting them annually at just the time when they were in the perfection of their bloom and evidently regarding such attention as no less a duty than a pleasure. These field studies were conducted very quietly, but so sedulously, intelligently and effectively that in the end they resulted in the acquisition of a store of information concerning the scope and value of which Mr. Walter Deane has been kind enough to express for me the following authoritative and pleasingly favorable opinion:

"Mr. Purdie was passionately fond of the study of plant life, taking special interest in certain groups of flowering species and vascular cryptogams. He was, strictly speaking, a field botanist, the systematic study of specific relations, acquired in the herbarium by work on the material there, not being much to his taste. Hence many groups, including the Najadaceæ, Gramineæ, Cyperaceæ, and the like, that require much closet study, did not particularly interest him, but for such difficult genera as *Desmodium*, *Lespedeza*, *Aster*, *Solidago*, and many others his interest was unbounded. From earliest spring to late autumn and often in the winter he loved to wander over field, wood and meadow, studying from close observation the abundant material ever at

hand. In this he was indefatigable, and few, if any, knew better the localities where choice plants grew. As a local botanist he held a high rank. He had a keen power of discrimination in the field; and was so thoroughly acquainted by long experience with the finer characters that distinguish closely related species that he often surprised his friends by naming difficult plants when seen from quite a distance. He was especially strong in his knowledge of the trees and shrubs of eastern Massachusetts. As Mr. Purdie did not travel much his field observations were largely confined to Massachusetts, but wherever he went he soon acquired a most excellent knowledge of the flora of that region. As an example of this love for the flora about him and desire to know the plants, may be mentioned his visits to his brother's home in Florida. His interest in the flora there is shown by the frequent communications he sent to the Gray Herbarium, accompanied by specimens, regarding perplexing species. In the summer of 1902 he called the attention of Mr. George E. Davenport, the late eminent pteridologist, to a strange form of *Aspidium spinulosum* (O. F. Müller) Sw., our Shield or Wood Fern, which he had found in Concord, Massachusetts. This form proved of good varietal distinction, and Mr. Davenport wished to associate Purdie's name with it. Our friend protested with characteristic modesty, and the plant was published as var. *Concordianum*, but it will always be associated with the discoverer by his friends. It was the same modesty that prevented him from publishing from time to time his botanical discoveries."

Joining the New England Botanical Club, as a Resident Member, on June 4, 1897, Mr. Purdie afterwards attended its meetings (held in Boston monthly from October to June of each year) more or less regularly, but seldom spoke at them. He was also a member of the Massachusetts Horticultural Society and took much interest in its popular exhibitions of fruits and flowers in Horticultural Hall, Boston, occasionally contributing to them collections of flowering goldenrods or other native plants, which attracted no little attention and were sometimes mentioned in the newspapers.

My personal acquaintance with Henry Purdie began about 1865, when I met him, for the first time, in a basement room of the State House, where the state collection of mounted birds (now at Am-

herst) was kept, and where E. A. Samuels had his cabinets of birds' eggs. Thither Ruthven Deane and I went rather frequently in early youth, taking eggs to exchange with Mr. Samuels, for whose memory there will always remain a warm place in both our hearts, for he was very kind and helpful to us,—as to all lads having tastes similar to his own and craving the ornithological lore and guidance which he was ever ready to impart. I was there one hot day in early summer when Henry Purdie came into the room, and we were introduced. He was then about twenty-five years old and, as I clearly remember, slight and graceful of figure, almost if not quite as bald as in later years, and very neatly dressed. We saw one another occasionally in the same place during the next few years, but it was not until 1869 that I began to know him at all well. Not long after that, our acquaintance ripened into a friendship which, without mar or interruption of any kind, continued up to the very end of his life. About the same time he established similarly close and lasting relations with Ruthven Deane, and somewhat less intimate yet very friendly ones with Henry W. Henshaw, Harry B. Bailey and W. E. D. Scott. These affiliations drew him with ever-increasing frequency to Cambridge, particularly between the years 1870 and 1882, a period of great ornithological activity and enthusiasm in and about the University city, especially memorable for the founding of the Nuttall Ornithological Club in 1873, and for the publication of its 'Bulletin' which began in 1876. Mr. Purdie took deep interest and had large share in the organization and early development of this Club. He was its President from March 20, 1875, to February 12, 1876; its Vice-President from 1873 to March 20, 1875; its Secretary from February 12, 1876, to December 1, 1885; its Corresponding Secretary from December 3, 1877, to December 9, 1878; a member of its Council from January 23, 1893, to December 7, 1896. There were few of its earlier meetings at which he failed to contribute something in the way of original field notes or of trenchant yet kindly criticism of those furnished by other members. Sometimes he would bring specimens of rare birds or eggs to show, or would read passages from ornithological books or pamphlets which few, if any, of us had ever seen or heard of, and which he had unearthed in one or another of the Boston libraries. He had then, as well as

later, the keenest possible interest in the literature of ornithology and kept in close touch with it. Thus, throughout a period extending over at least a dozen or fifteen years, he was one of the leading spirits of the Nuttall Club, taking a prominent part in all its affairs and rendering it most loyal and efficient service. But with advancing years he came to its meetings somewhat less often than before although not infrequently. His very last appearance was at one held on the evening of March 6, 1911, less than a week before his final illness began, and but little more than three weeks before he died.

The editors of that pioneer journal, the 'Bulletin of the Nuttall Ornithological Club,' were often indebted to Mr. Purdie for valuable assistance or critical advice. During the eight years of its existence, he contributed to its pages no less than twenty-five articles and notes of varying length. Among the earlier of these were two,—a short review signed by his initials merely, and a seven-page article under his full name,—in which he criticised rather sharply, but in the main quite justly, certain statements and rulings made about a year before, in a 'Catalogue of the Birds of New England,' by Dr. T. M. Brewer. These papers excited general interest at the time of their appearance. They show better, perhaps, than anything else that Mr. Purdie ever wrote, the scope and accuracy of his ornithological knowledge when he was in his prime, and the ability he possessed for temperate and logical argument.

Having been included, as a matter of course, among those who were invited to take part in the organization of the American Ornithologists' Union and being present at its first Congress held in New York City on September 26, 1883, Henry Purdie became one of its Original Members or Founders, now known as Fellows. He retained this membership up to the time of his death, but his attendance at meetings of the Union was mainly restricted to those held in Boston and Cambridge. Although during the earlier years of its existence, he served on certain of its Committees, his name is not included in any of its lists of officers. His only communication to the pages of its journal, 'The Auk,' was a brief note relating to the occurrence of the Prothonotary Warbler in Massachusetts, published in 1886. He was a member of the Boston Society of

Natural History from January 3, 1866, to October, 1875, but its publications do not apparently contain anything from his pen, although they mention an ornithological record made by him at one of its meetings.

The articles and notes which appeared under or over Henry Purdie's name, of which a list will be given at the end of this memoir, by no means represent in full the contributions which he made to the literature of ornithology. For some of his most important service of this kind was rendered indirectly, and in a sense anonymously, through assistance and advice given to other writers. Thus he helped Mr. Samuels very materially in the preparation of the 'Ornithology and Oölogy of New England,'¹ published in 1867, and his critical knowledge and ability were drawn upon still more largely by Dr. Coues in connection with the production of 'New England Bird Life,' which appeared in 1881. As was eminently characteristic of him, he seemed not only indifferent concerning the credit which he received for such work, but actually averse to having anything said about it. Even his closest friends were often unable to inform themselves definitely through him as to the precise nature and amount of it that he performed.

During the earlier years of his life, Mr. Purdie was an active, persistent and very successful collector, especially of nests and eggs of New England birds. The birds themselves were seldom molested by him, for he was averse to taking animal life of any kind, an indifferent shot, and gifted with little or no skill in the art of taxidermy. Nevertheless, he accumulated several hundred bird skins, most of which were obtained by gift or purchase. At the time of which I am now writing, his sense of hearing was remarkably keen and critical, but he was very near-sighted and habitually wore eye-glasses. His high enthusiasm, shrewd powers of observation and deep and reverent love of nature combined to make him a delightful and much-sought companion for out-of-door excursions of every kind. Despite his intimate association with woods and

¹ In the Preface to this work Mr. Purdie's name receives little more than casual mention, but in a footnote to page 320 of the main text Mr. Samuels expresses indebtedness to him for the use of "full and copious notes and memoranda on the arrival of species, which are of value, having been conducted for several years."

fields, he seemed, oddly enough, not to be quite at home in them, partly, no doubt, because he commonly went to them dressed in ordinary city clothes, still more largely, perhaps, because he had an awkward, blundering way of getting over fences, walls and ditches, and through dense brush. Yet while another, better equipped for such undertakings and apparently more skilful in performing them, was ranging about quietly and systematically, it very often happened that Henry Purdie was the first to detect the elusive bird, the cunningly concealed nest, or the rare plant, of which they were both in quest, apparently stumbling on it quite by chance, but in reality guided to it, without doubt, by that intuitive sense which is possessed by all good hunters and which he evidently had in generous measure, making frequent use of it, however unconsciously, whenever seeking hidden things. The collection of nests and eggs¹ which he formed, although not large, contained an excellent representation of those of the commoner birds of eastern Massachusetts besides a considerable number of specimens intrinsically rare or of exceptional local interest, from this and various other parts of North America, but chiefly from New England. Among the latter were several sets of the beautiful eggs of the Olive-sided Flycatcher, which he took in the neighborhood of Boston at various times before 1875. Prior to the year 1870, he had confined his field work mostly to localities lying within easy reach of West Newton, where he lived, but during the next following decade he gave it wider scope, collecting with me at Lake Umbagog (June 13-28, 1873, September 14-19, 1874, and May 10-June 24, 1876); with J. N. Clark at Saybrook, Connecticut (in June, 1875); with Ruthven Deane and Robert R. McLeod at Houlton, Maine (in June, 1878). In June, 1881, he made a tour through New Brunswick, where he met Montague Chamberlain for the first time (they afterwards became intimate friends) and spent eleven days at Campbellton on Bay Chaleur. Still later, after he had become interested in botany, he went to the White Mountains repeatedly in summer, was with me in camp at Lake Umbagog on one or two occasions in autumn, and twice visited his brother Alfred in Florida, remaining there for the greater part of two

¹ He gave a few of these to ornithological friends and most of the others to the Museum of Comparative Zoölogy, Cambridge, several years before he died.

winters. Towards the close of his life, he found much to attract and interest him in Concord, Massachusetts, where, at a log cabin on a wooded hillside by the river, or at an old farm-house surrounded by fields, orchards and woodland, he was my frequent and ever welcome guest. Here the unconventional, out-of-door life suited his simple tastes, and he could indulge as freely as he chose in the botanical rambles which he so loved. If, as seemed evident, he derived pleasure from those visits, he gave much more of it than he received, endearing himself to every one about the place by his unfailing kindness and thoughtfulness of word and deed.

It has been said that "every man's faults are the shadows of his virtues." This was certainly true in Henry Purdie's case, for, if not literally faults, the extreme gentleness, sensitiveness and modesty, which were among his most pronounced attributes, unquestionably operated to his worldly disadvantage, stifling whatever ambition he may have possessed and preventing him from taking a place among scientific men and affairs which he might otherwise have achieved, and to which he was fairly entitled by reason of his shrewd intelligence, excellent critical ability and wide knowledge and experience as an ornithologist and botanist. He had high standards of personal honor and virtue, but was very lenient with respect to the failings of others. His estimate of his own ability and attainments was so genuinely modest that, whenever any one spoke of them in terms of appreciation, he always seemed surprised and often incredulous. He was canny and very knowing in a Scotch sort of way and had keen intuitive judgment of human character — besides many other things — which was rarely, if ever, mistaken. His temperament often made decision, — about even small affairs, — almost a martyrdom, and thereby lost him opportunities which should have been promptly grasped; but nearly always his doubt hung on the fear that some one else might be inconvenienced or disappointed.

Most of the shortcomings just alluded to were obviously the direct and not unnatural outcome of an exceptionally large and tender heart, of an abnormally sensitive conscience, of a delicately refined nature, and, above all, of a deep and abiding concern for the welfare and happiness of others. Even if such virtues must

cast "shadows" more or less detrimental to the material prosperity of those who possess them, our world would be a better place to live in were it more generally overshadowed by them.

As a matter of course, they won for Mr. Purdie many appreciative and loving friends. At a surprise party given for him in Cambridge on his seventieth and last birthday, these came from far and near in such numbers as almost to overflow the house. No one of them ever appealed to him in vain for assistance or sympathy which it was in his power to give, while the unsolicited kindly attentions which he showed them were unfailing and very numerous. He was, indeed, the most unconsciously unselfish man I have ever known, wholly oblivious to self interest, yet ever mindful of the interests of others and seeming to regard whatever he did for them quite as a matter of course and of little or no importance, however great the service rendered. At railway stations he was habitually on hand to greet incoming or outgoing ornithological friends with grateful words of welcome or farewell and helpful acts of kindness. Whenever the American Ornithologists' Union met in Cambridge, he devoted himself to looking after the comfort and welfare of its visiting members, especially the humbler ones among them. His thoughtfulness of others, always unostentatious, was sometimes shown in rarely tactful and delicate ways. The late Howard Saunders had interesting experience of this when visiting Boston in 1884. At the close of a day spent in going about the city with Mr. Purdie, he parted with him at the State House, declining for reasons which I have forgotten to be escorted by him to Bowdoin Square, whither he walked to take a horse-car out to Cambridge. On nearing his destination and happening to glance back, he saw, at some distance to the rear, stealing along the shadowy side of the street, a dim figure which he recognized as that of Mr. Purdie, who was following him thus surreptitiously to make sure that he did not lose his way among the old 'cowpaths' of Boston, or get on the wrong car. When, years afterwards, Mr. Saunders related this incident to me in London, he wound up the story by saying very feelingly: "Of all the friends I made in America, I value most Henry Purdie."

It must not be inferred from anything which I have said or left unsaid, that Henry Purdie was devoid of worthy pride or of true

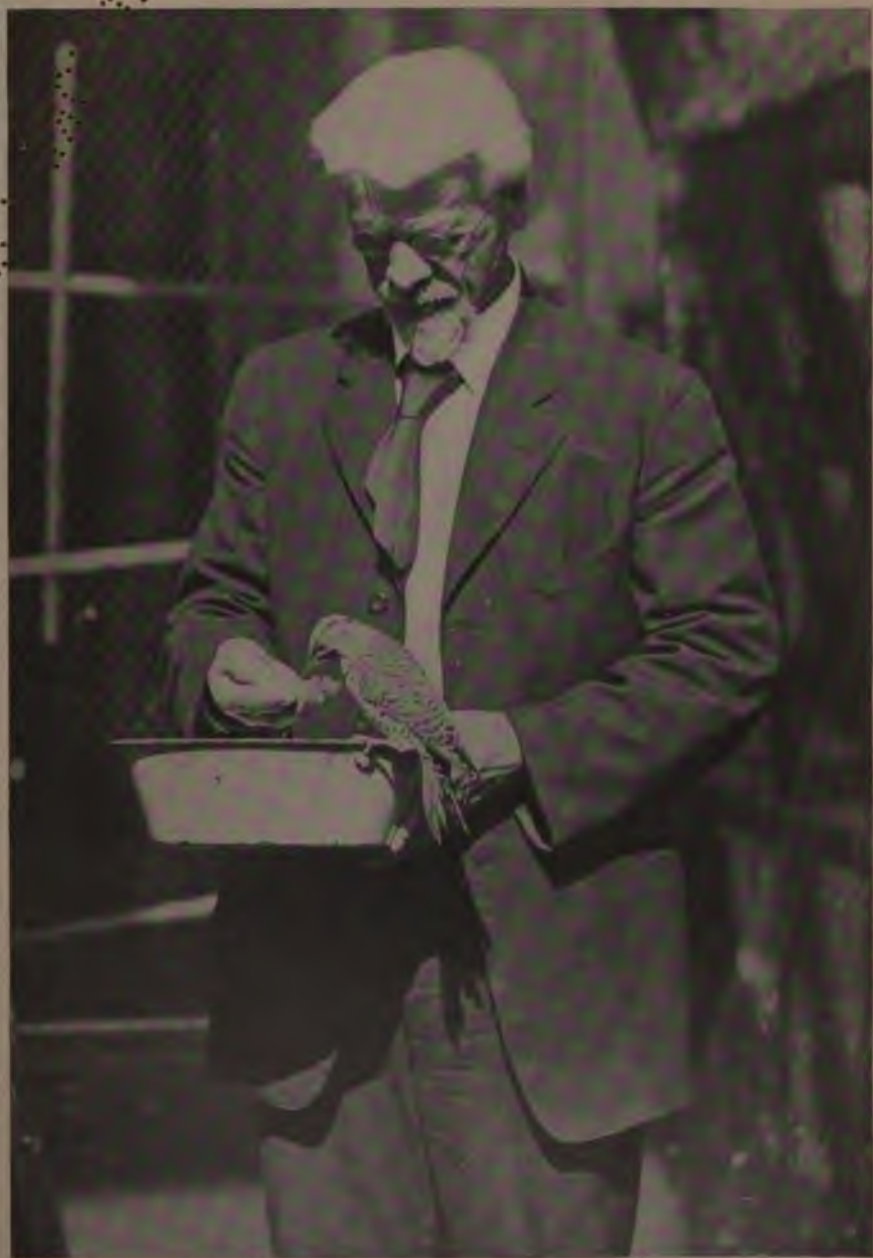
manliness. Beneath his quiet, unassuming manner lay concealed a really proud spirit and no little self-reliance and hardihood. These were manifested by his wise fastidiousness in the choice of intimate associates; by his unwillingness to accept favors which could not be repaid; by the decided opinions which he held and was quite able vigorously to defend; by his intolerance of injustice,—which, when so minded, he could rebuke with prompt and effective speech or action; by the calmness and resourcefulness with which he faced grave dangers and serious troubles — although addicted to worry and tribulation concerning lesser risks and annoyances. If he failed to achieve all the worldly success and advancement which might easily have been his had he been only a little differently constituted, it may be said of him with absolute truth that he lived a pure, honorable and very useful life, serving faithfully and acceptably, first his country; next his state; then the natural science that he loved; finally a host of friends no one of whom can ever forget the charm of his affectionate, guileless nature or cease to be thankful for the privilege of having come in close touch with it.

Although perhaps not complete the following list includes all the titles of published ornithological notes and papers written by Henry Purdie of which I have present knowledge.

1. [A letter relating to the Golden-winged Warbler.] In this letter early instances of the occurrence of the species at West Newton, Massachusetts, are reported and its habits and song rather fully described; published by E. A. Samuels, *Orn. & Oöl. of N. E.*, 1867, pp. 214, 215.
2. [Announcement of the Capture of Tennessee Warblers in Newton, Mass.] *Proc. Bos. Soc. N. H.*, Vol. XIII, 1869, p. 93.
3. Tennessee Warbler. *Am. Nat.*, Vol. III, Aug. 1869, p. 331.
4. Golden-winged Warbler. *Am. Nat.*, Vol. III, Nov. 1869, p. 497.
5. *Colluris Ludovicianus*. *Am. Nat.*, Vol. VII, Feb. 1873, p. 115.
6. Notes on some of the Rarer-Birds of New England. *Am. Nat.*, Vol. VII, Nov. 1873, pp. 692, 693.
7. Birds of New England. [A review, signed by initials "H. A. P.," of Dr. T. M. Brewer's 'Catalogue of the Birds of New England' published in 1875.] *Bull. Nutt. Orn. Club*, Vol. I, Sept. 1876, pp. 72, 73.
8. The Nest and Eggs of Traill's Flycatcher, as observed in Maine. *Bull. Nutt. Orn. Club*, Vol. I, Sept. 1876, p. 75.
9. Distribution of New England Birds.—A Reply to Dr. T. M. Brewer. *Bull. Nutt. Orn. Club*, Vol. II, Jan. 1877, pp. 11–17.
10. Notice of a Few Birds of Rare or Accidental Occurrence in New England. *Bull. Nutt. Orn. Club*, Vol. II, Jan. 1877, pp. 20–22.

11. The Lark-Finch (*Chondestes grammaca*) again in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. III, Jan. 1878, p. 44.
12. The Black-throated Bunting (*Euspiza americana*) nesting in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. III, Jan. 1878, p. 45.
13. [Letter to Linnean Society relating to nests and eggs of Traill's and Acadian Flycatchers.] *For. & Str.*, Vol. X, No. 12, Apr. 25, 1878, p. 216.
14. Traill's Flycatcher. *For. & Str.*, Vol. X, No. 14, May 9, 1878, p. 255.
15. Sennett's Notes on the Ornithology of the Lower Rio Grande, Texas. [Review signed "H. A. P."] *Bull. Nutt. Orn. Club*, Vol. III, July, 1878, pp. 144, 145.
16. Capture of the Yellow-throated Warbler in Massachusetts, and Notes on other Rare Massachusetts Birds. *Bull. Nutt. Orn. Club*, Vol. III, July, 1878, p. 146.
17. The Nest and Eggs of the Yellow-Bellied Flycatcher (*Empidonax flaviventris*). *Bull. Nutt. Orn. Club*, Vol. III, Oct. 1878, pp. 166-168.
18. The Golden-cheeked Warbler and Black-chinned Hummingbird in Texas. *Bull. Nutt. Orn. Club*, Vol. IV, Jan. 1879, p. 60.
19. The Great Carolina Wren (*Thryothorus ludovicianus*) in Connecticut. *Bull. Nutt. Orn. Club*, Vol. IV, Jan. 1879, p. 61.
20. Nesting of the Great Northern and Loggerhead Shrikes in Maine. *For. & Str.*, Vol. XII, No. 9, Apr. 3, 1879, p. 166.
21. The Loggerhead Shrike in Maine. *For. & Str.*, Vol. XII, No. 14, May 8, 1879, p. 265.
22. Record of Additional Specimens of the White-throated Warbler (*Helminthophaga leucobronchialis*). *Bull. Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 184, 185.
23. Another Kirtland's Warbler (*Dendroica kirtlandi*). *Bull. Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 185, 186.
24. The Loggerhead Shrike breeding in Maine. *Bull. Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 186, 187.
25. MacFarlane's Gerfalcon (*Falco gyrfalco sacer*) in Maine. *Bull. Nutt. Orn. Club*, Vol. IV, July, 1879, pp. 188, 189.
26. *Corvus ossifragus* on Long and Staten Islands, N. Y. *Bull. Nutt. Orn. Club*, Vol. V, Oct. 1880, p. 240.
27. The Purple Gallinule in New England. *Bull. Nutt. Orn. Club*, Vol. V, Oct. 1880, p. 242.
28. The Avocet (*Recurvirostra americana*) in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VI, April, 1881, p. 123.
29. *Melanerpes erythrocephalus* about Boston. *Bull. Nutt. Orn. Club*, Vol. VII, Jan. 1882, p. 57.
30. *Ammodramus caudacutus*.—A somewhat inland Record on the Atlantic Coast. *Bull. Nutt. Orn. Club*, Vol. VII, April 1882, p. 122.
31. *Pelidna subarquata* on the Maine Coast. *Bull. Nutt. Orn. Club*, Vol. VII, April, 1882, p. 124.

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CHARLES OTIS WHITMAN.

32. *Rhynchops nigra*.— An early Record for the Massachusetts Coast. *Bull. Nutt. Orn. Club*, Vol. VII, April, 1882, p. 125.

33. *Garzetta candidissima* at Nantucket, Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VII, Oct. 1882, p. 251.

34. Rare Warblers in Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VII, Oct. 1882, p. 252.

35. A Flock of White Herons (*Herodias egretta*) in Eastern Massachusetts. *Bull. Nutt. Orn. Club*, Vol. VIII, Oct. 1883, pp. 242, 243.

36. An Earlier Occurrence of the Prothonotary Warbler in Massachusetts. *Auk*, Vol. III, Oct. 1886, p. 488.

SOME REMINISCENCES OF THE LATE PROFESSOR C. O. WHITMAN.

BY R. M. STRONG.

Plate II.

A PROMINENT characteristic of Professor Whitman was his success in the study of live animals. On many occasions the writer was impressed by Professor Whitman's ability to capture and handle timid doves without the frantic struggles that would occur with less skilful treatment. He was equally fortunate with other animals.

Young birds, taken from the nest, were reared with great success, and they became very tame. The accompanying picture illustrates a characteristic scene in the yard back of his house. It shows Professor Whitman standing in a pigeon cage, and was taken by the writer, October 10, 1908. The Flicker perched on the pan and feeding from Professor Whitman's hand was one of several which were being reared because of their interesting color pattern.

Professor Whitman enjoyed natural history work in the field, though in his later years he seldom felt free to leave his pigeons even for a half day in the country. One of these exceptional breaks occurred, however, on June 15, 1910, only a few months before his death. In company with a colleague and the writer, a marsh outside of Chicago where marsh birds were nesting in

unusual abundance was visited. The weather was beautiful, and Professor Whitman was in fine spirits.

A small duck boat conveyed the party to nests of Coots, Rails, Gallinules, Black Terns, etc., with eggs and young birds just hatched. These aroused keen enthusiasm.

A unique experience was an encounter with some young Pied-billed Grebes and their parents. The writer had found the nest five days before, with two downy young just hatched which were lying on the material covering the other eggs not yet hatched, as is the custom of grebes. On this later visit, we saw the parent grebes swimming with several of their offspring in open water not many rods from the now deserted nest. Professor Whitman urged a very quiet and deliberate approach. Our little boat in which we were obliged to sit with some care to avoid tipping, was gradually paddled up to within a very few rods of the grebes. As we drew near, the little grebes gathered about one of the parents and took places inside its wings. In another moment, the bird dived taking the young with her. We were able later to capture one of the little grebes for a few minutes' inspection.

NOTES ON THE SUMMER BIRDS OF THE ST. JOHN VALLEY, NEW BRUNSWICK.¹

BY CHARLES W. TOWNSEND, M. D.

THE following observations were made between July 11 and August 4, 1911, in the lower part of the valley of the St. John River, New Brunswick, between St. John and Fredericton. Two days were spent at St. John, a day on the Kennebecasis River, eight days at Glenwood, three days at Upper Greenwich, a day at Fredericton, and nine days at Gerow's Landing, Wickham.

As one ascends the St. John River, one is struck with the sudden change in the physical character of the valley from the hilly,

¹ Read before the Nuttall Ornithological Club, October 2, 1911.

almost mountainous and forest clad shores of the southern portions, beginning close to the city of St. John and extending upwards for about thirty miles, to the more pastoral scenery where the river is bordered by a flood plain, and where the islands, instead of being rocky and forested as in the south, are low-lying mud banks on which hay in great quantities is produced. Back of this flood region the gently sloping hills are largely given up to farming, while the forest recedes to the background. The forest is chiefly spruce — white, black and red — and balsam fir, with arbor vitæ and larches in places, and an occasional white pine and hemlock. Canoe, white and yellow birches, beeches, rock maples, mountain ashes and poplars also form parts of the forest. All of these trees in the lower, wilder regions of the valley sometimes attain considerable dimensions, especially in that portion back of Glenwood and Upper Greenwich. Beginning at Glenwood, red oaks become common in the river valley, while the graceful wineglass-shaped American elm is the most conspicuous tree on the low shores and islands, and an occasional butternut and linden are to be seen.

Recent subsidences has depressed this whole region to such an extent that the former river cutting has become an estuary of the sea, the force of whose tides are felt even to Fredericton, a distance of eighty-four miles.

While the region of the city of St. John and the hills back of it are cooled by the proximity of the Bay of Fundy with its rushing tides and frequent fogs, the broad alluvial central valley has a more genial summer climate, as shown by a comparison of the mean summer temperature in Fredericton and St. John. The average of the mean temperature for the month of May in the years 1901, 1902, 1904 and 1905 was 2.4° Far. higher at Fredericton than at St. John. In June of these years it was 2.5° higher, while in July it was 5° higher in Fredericton than in St. John.

As a result of this proximity of two such unlike summer climates there is an admixture here of Boreal and Transition species. As long ago as 1869 (*Am. Naturalist*, Vol. III, 1869, p. 331), the late Mr. Henry A. Purdie suggested that some birds not common on the central and southern Maine coast may have reached the northern coast of Maine by the "Saint Lawrence and Maine Central

water route." Mr. O. W. Knight in his 'Birds of Maine' in speaking of the Rose-breasted Grosbeak, which he states "is rare along the coast and in certain of the central portions of the State, while north it is again locally common," says: "It seems quite probable indeed that these northern representatives of the species enter the State from the west and pass across it by some regular migration route." Montague Chamberlain, in the Bulletin of the Natural History Society of New Brunswick, No. II, 1883, p. 40, says "that many of the species of birds rarely met with in the vicinity of the coast of the Bay of Fundy during the breeding season are much more abundant at that time beyond the line across which the humidity and low temperature so characteristic of this coast at that season do not penetrate, said line being drawn some 15 or 20 miles from the shore of the Bay."

That some of these birds of the St. John valley that are less common farther south on the coast, migrate north in the interior until they reach the valley of the St. John, and follow it until they are arrested by the colder regions bordering the Bay of Fundy, seems therefore a not unlikely theory. The fact that on July 31 I saw forty-five Night Hawks flying as if in migration in a *northerly* direction over the river valley at Wickham is certainly suggestive.

The further extension of migration routes from this warm St. John Valley to the north is clearly shown in an interesting paper by Professor W. F. Ganong (Bull. Nat. History Soc. of New Brunswick, Vol. V, part iv, 1906, pp. 423-433). One of these natural migration routes extends northwest along Washademoak Lake, a great drowned side valley of the St. John River above Wickham, the Canaan and the Buctouche Rivers, Northumberland Straits, Prince Edwards Island, and Cascumpec Harbor. North of this and parallel with it is a route by way of Grand Lake, Salmon and Richibucto Rivers, while farther north the Nashwaak and Miramichi Rivers together, and the Nepisiquit and the Restigouche Rivers form three other obvious routes. Besides these, Professor Ganong has sketched numerous probable and possible valleys all extending northeast and southwest.

On the southern coast of the Labrador Peninsula, in the Mingan region, the avifauna as far east as Natashquan is largely Canadian with a sprinkling of birds of the Hudsonian zone and even of some

that are characteristic of the Alleghanian Zone,¹ while the shore to the eastward, which feels more strongly the arctic current — for icebergs float as far west as Natashquan — is the summer home of Hudsonian and Arctic birds. It is possible that the Canadian fauna reaches the Mingan region of Labrador by way of the valley of the St. Lawrence, or by the migration routes from the St. John valley just sketched, thence north across the narrow part of the Gulf of St. Lawrence over the island of Anticosti, or by both routes. Much further study is needed to elucidate these problems.

The following is a briefly annotated list of the birds observed, all of which are, I believe, summer residents.

1. *Larus argentatus*. HERRING GULL.— A few in the harbor of St. John.
2. *Sterna hirundo*. COMMON TERN.— A few in the Kennebecasis River, and on the St. John River all the way from St. John to Fredericton. At Wickham and Upper Greenwich birds were frequently seen flying down the river with small fish hanging from their bills, while the return trips were made without the fish.
3. *Phalacrocorax auritus auritus*. DOUBLE-CRESTED CORMORANT.— A single bird, apparently of this species, seen on the river about eight miles above St. John.
4. *Anas rubripes tristis*. BLACK DUCK.— A few above Upper Greenwich.
5. *Clangula clangula americana*. WHISTLER.— One seen on July 12 on the Kennebecasis.
6. *Botaurus lentiginosus*. BITTERN.— One at Queenstown, July 26.
7. *Ardea herodias herodias*. GREAT BLUE HERON.— Not uncommon on the Kennebecasis and on the St. John above Upper Greenwich.
8. *Philohela minor*. WOODCOCK.— Two seen at Glenwood, July 17.
9. *Actitis macularia*. SPOTTED SANDPIPER.— Common along the rivers and brooks.
10. *Bonasa umbellus togata*. CANADIAN RUFFED GROUSE.— Several at Glenwood and at Upper Greenwich.
11. *Zenaidura macroura carolinensis*. MOURNING DOVE.— A pair nesting in a spruce at Glenwood, July 20.
12. *Circus hudsonius*. MARSH HAWK.— One at Wickham, August 4.
13. *Accipiter velox*. SHARP-SHINNED HAWK.— One seen at Glenwood and one at Wickham.
14. *Buteo borealis borealis*. RED-TAILED HAWK.— One at Wickham.
15. *Buteo platypterus*. BROAD-WINGED HAWK.— Two were seen

¹ Townsend and Bent, *Auk*, XXVII, 1910, pp. 1-18.

at Glenwood circling together over the forest, uttering their clear, double, *ter-whee*.

16. *Halieetus leucocephalus leucocephalus*. BALD EAGLE.— Several seen from Upper Greenwich to Fredericton. At the former place two or three in immature, and one in adult plumage were seen daily, and a farmer told me that a pair nested on a cliff, and that they had carried off eight of his chickens. He said that one of the young birds had seized a hen, but was unable to carry her off. The hen made such an outcry that the farmer came to her rescue and the eagle departed. At Wickham I watched an adult and young bird circling near together, and once the young turned on its side and thrust out its legs as if about to grapple with the adult.

17. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.— Heard singing several times at Glenwood.

18. *Ceryle alcyon*. BELTED KINGFISHER.— Not uncommon. At Wickham I heard one practising its rattle in so low a tone that it suggested the distant trill of a wren.

19. *Dryobates villosus villosus*. HAIRY WOODPECKER.— Common.

20. *Dryobates pubescens medianus*. DOWNY WOODPECKER.— Common.

21. *Sphyrapicus varius varius*. YELLOW-BELLIED SAPSUCKER.— One seen at Hampton, July 12.

[*Melanerpes erythrocephalus*, Red-headed Woodpecker. A mounted specimen was seen in the taxidermist shop of Mack Bros. in Fredericton, and I was told that the bird was shot by the guide Tom O'Leary at Beavertown, York County, on June 1, 1911, and brought to the taxidermist in the flesh.]

22. *Colaptes auratus luteus*. NORTHERN FLICKER.— Common.

23. *Chordeiles virginianus virginianus*. NIGHTHAWK.— Common and evidently nesting on roofs in St. John and Fredericton. On July 31, at 5.30 p. m. at Wickham, I counted 45 Nighthawks flying *north* high over the river.

24. *Chaetura pelagica*. CHIMNEY SWIFT.— Abundant. At Fredericton, on July 25, I watched a large flock of Swifts enter for the night a chimney on the southwest corner of the Parliament Building. Sun set at about 8 p. m. At 8.24 p. m. one bird set its wings and dropped into the chimney and soon they began dropping in fast, while the flock circled first one way then another or crowded together in a confused mass, twittering loudly all the time. Owing to the proximity of the dome regular circling was somewhat interfered with, but as a rule the birds circled in the direction of the hands of a clock, and individuals would drop out and into the chimney in dozens when the circle passed over it. Occasionally they would all swoop off to the other side of the building, soon to return. At 8.45 p. m. practically all the birds had entered the chimney and I had counted roughly,— at first singly and later by tens,— 2200 birds. A minute later, when it was nearly dark, six stragglers appeared, five of

which entered the chimney while the sixth retired by itself to another chimney.

25. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.—Two seen.

26. *Tyrannus tyrannus*. KINGBIRD.—One seen at Glenwood. Common at Wickham.

27. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—One seen at Wickham, August 4.

28. *Myiochanes virens*. WOOD PEWEE.—One at Fredericton and one at Upper Maugerville.

29. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.—Common at Glenwood.

30. *Empidonax traillii alnorum*. ALDER FLYCATCHER.—A few at Glenwood and Wickham, in full song.

31. *Cyanocitta cristata cristata*. BLUE JAY.—A few seen.

32. *Corvus brachyrhynchos brachyrhynchos*. CROW.—Common.

33. *Dolichonyx oryzivorus*. BOBOLINK.—Abundant in river meadows at Wickham, not singing; a flock of thirty or forty.

34. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.—Common in the meadows of the Kennebecasis River and on the St. John above Upper Greenwich.

35. *Quiscalus quiscula seneus*. BRONZED GRACKLE.—Common.

36. *Carpodacus purpureus purpureus*. PURPLE FINCH.—Abundant.

37. *Loxia curvirostra minor*. RED CROSSBILL.—A small flock seen at Glenwood on July 15.

38. *Loxia leucoptera*. WHITE-WINGED CROSSBILL.—Eight or ten seen at Glenwood on July 20.

39. *Astragalinus tristis tristis*. GOLDFINCH.—Abundant.

40. *Passer domesticus*. ENGLISH SPARROW.—Abundant in cities and larger settlements. Although they were common in the village of Wickham, there were none three miles away at Gerow's landing. This fact probably accounted for the successful broods of turkeys raised at the latter place, as they were not infected by the Sparrows with the blackhead disease.

41. *Spinus pinus pinus*. PINE SISKIN.—A flock of six seen at Glenwood on July 16 and 17.

42. *Poecetes gramineus gramineus*. VESPER SPARROW.—Common at Wickham. Not seen elsewhere.

43. *Passerculus sandwichensis savanna*. SAVANNAH SPARROW.—Abundant.

44. *Passerherbulus nelsoni subvirgatus*. ACADIAN SHARP-TAILED SPARROW.—Very abundant in the meadows of the St. John at upper Greenwich, Wickham and Hampstead. The A. O. U. Check-list states of this bird that it is found in the "Salt marshes of the Atlantic coast," although Dwight (Auk, XXII, 1896, p. 276) speaks of it as "peculiar to

the fresh and salt water marshes of the maritime Provinces of Canada." These marshes where I found it were made up entirely of fresh water vegetation including arrow heads and white pond lilies, although the impulse of the tides is felt there. The curious song of this bird, which resembles closely the hiss of hot iron in water followed usually by two short low notes, was heard on every hand in these meadows during my visit there from July 21 to August 4. Occasionally a bird would indulge in a flight song, uttering short notes as he flew up, followed by rapid repetitions of his simple song during the descent to the grass where he continued to sing. One repeated his song in the grass ten times in a minute. A female that was taken contained eggs, evidently of the second brood, for full grown young were common. These were in the juvenal dress which resembles in general coloration that of the juvenal Bobolink, although of course the finches are much smaller. A juvenal specimen obtained was easily distinguished from the juvenal *caudacutus*. In the latter the markings on the sides of the chest are distinct, in the former indistinct and few.

45. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.— Abundant and in full song. At Glenwood on July 15 when the sun set at 7.49 these birds sang until 9 p. m. when it was too dark to see to read.

46. *Spizella passerina passerina*. CHIPPING SPARROW.— Abundant.

47. *Junco hyemalis hyemalis*. SLATE-COLORED JUNCO.— Abundant.

48. *Melospiza melodia melodia*. SONG SPARROW.— Abundant.

49. *Melospiza georgiana*. SWAMP SPARROW.— Common at Hampton and Wickham.

50. *Progne subis subis*. PURPLE MARTIN.— Fifteen or twenty pairs were nesting in the iron framework of the bridge at Hampton over the Kennebecasis River. English Sparrows were constantly fighting with them. At Brown's flat I noticed several Martin houses inhabited only by English Sparrows, and was told that the Martins had been entirely driven out by these pests. At Evandale were several small houses inhabited by Martins; no English Sparrows were to be seen. At Fredericton and at Wickham Martins were frequently seen.

51. *Petrochelidon lunifrons lunifrons*. CLIFF SWALLOW.— Abundant. At Glenwood I counted sixty-five nests on one barn and shed.

52. *Hirundo erythrogastra*. BARN SWALLOW.— Common.

53. *Iridoprocne bicolor*. TREE SWALLOW.— Common.

54. *Riparia riparia*. BANK SWALLOW.— A few seen.

55. *Bombycilla cedrorum*. CEDAR WAXWING.— Common.

56. *Vireosylva olivacea*. RED-EYED VIREO.— Abundant.

57. *Lanivireo solitarius solitarius*. BLUE-HEADED VIREO.— Common.

58. *Mniotilta varia*. BLACK AND WHITE WARBLER.— Common.

59. *Vermivora rubricapilla rubricapilla*. NASHVILLE WARBLER.— Abundant, in full song.

60. *Compsothlypis americana usneæ*. NORTHERN PARULA WARBLER.— Abundant, in full song.
61. *Dendroica æstiva æstiva*. YELLOW WARBLER.— Not uncommon.
62. *Dendroica cærulescens cærulescens*. BLACK-THROATED BLUE WARBLER.— One at Glenwood, July 14.
63. *Dendroica coronata*. MYRTLE WARBLER.— Common and in song.
64. *Dendroica magnolia*. MAGNOLIA WARBLER.— Abundant, in full song.
65. *Dendroica castanea*. BAY-BREASTED WARBLER.— Common. At Glenwood, Upper Greenwich and at Wickham I saw one or two nearly every day and twice heard the male sing. At the two last named places I saw them feeding fully grown young.
66. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— Common and in song.
67. *Seiurus aurocapillus*. OVEN-BIRD.— Two or three heard singing at Glenwood, and one seen giving his flight song. One seen with young at Wickham on August 2.
68. *Geothlypis trichas trichas*. MARYLAND YELLOW-THROAT.— Common, in song.
69. *Wilsonia canadensis*. CANADA WARBLER.— One seen at Glenwood on July 14.
70. *Setophaga ruticilla*. REDSTART.— Rather common.
71. *Nannus hiemalis hiemalis*. WINTER WREN.— Common and in song.
72. *Certhia familiaris americana*. BROWN CREEPER.— A few seen at Glenwood.
73. *Sitta canadensis*. RED-BREASTED NUTHATCH.— One at Wickham, August 3 and 4.
74. *Penthestes atricapillus atricapillus*. CHICKADEE.— Abundant.
75. *Penthestes hudsonicus hudsonicus*. HUDSONIAN CHICKADEE.— Nearly as common as *P. atricapillus*. On one occasion only, at Glenwood on July 15, I heard the clear warbling notes of this species.
76. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.— Abundant.
77. *Hylocichla fuscescens fuscescens*. VEERY.— Two were frequently heard singing at Glenwood in a thicket by the river, and one by Jones's Creek.
78. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.— Abundant and in full song, especially at Glenwood from July 13 to July 21.
79. *Hylocichla guttata pallasii*. HERMIT THRUSH.— Abundant and in full song.
80. *Planesticus migratorius migratorius*. ROBIN.— Abundant.
81. *Sialia sialis sialis*. BLUEBIRD.— The only Bluebirds I saw were a pair in the fields at Jones's Creek, Glenwood, about two miles from its mouth at the St. John River. This was on July 15.

A NAME FOR THE HAWAIIAN LINNET.

BY J. GRINNELL.

IN THE University of California Publications in Zoölogy, Volume 7, February, 1911, pages 179-195, the fact was recorded that the Linnet of the Hawaiian Islands at the present time differs conspicuously from the Linnet of California in that the males are yellow or orange, instead of red. It was further shown that in all probability the Hawaiian stock was introduced from California less than forty years ago.

While, as shown in the paper cited, I recognize the fact that occasional examples from different parts of the range of *Carpodacus frontalis* show the same characters as the Hawaiian birds (as do also cage-birds), this does not at all mean that these aberrant examples are of the same immediately genetic stock; in fact, because of remoteness of locality, they are obviously not closely related. In the former case the feature is sporadic, in the latter constant and peculiar to a distinct geographic area. No matter how recently this feature of the Linnet of the Hawaiian Islands may have been acquired, or by what one of various complex processes, the apparent fact remains: the peculiarity of the present day Hawaiian Linnet is specific. To meet the requirement of systematic zoölogy, a name should therefore be provided for it, which I herewith do:

***Carpodacus mutans*, new species.**

HAWAIIAN LINNET.

TYPE, male adult; no. 12611, Univ. Calif. Mus. Vert. Zoöl.; Haiku, Maui, Hawaiian Territory; February 22, 1910; collected by Annie M. Alexander; orig. no. 465, A. M. A.

DIAGNOSIS. — Closely similar to *Carpodacus frontalis* as occurring in the San Francisco Bay region of California; but crimson areas in males of *frontalis*, yellow or orange in males of *mutans*.

DESCRIPTION OF TYPE. — Rump, continuous frontal, supra-ocular and supra-auricular area, throat, malar region and chest, deep chrome; top of head, nape and breast washed with same; on forehead the color intensi-

fied towards orange; elsewhere dorsally, hair brown, with centers of exposed ends of feathers darkest; wings and tail dark hair brown with pale edgings; lower breast, sides, flanks and crissum, with narrow shaft-streaks of hair brown on a dull whitish ground; streaks on flanks and crissum broadest, narrowest on belly; maxilla, feet and legs dark hair brown; mandible pale hair brown. Wing, 79 mm.; tail, 58.7; tarsus, 17; hind toe with claw, 12; culmen, 10.3; bill-from-nostril, 8.2; gonys, 7.5; width of maxillary portion of bill at base, 7.1; depth of bill (normally closed) through nostril from proximal end of culmen to symphesial portion of mandibular ramus, 8.3.

RANGE. — Specimens are at hand from the islands of Oahu, Molokai, and Maui, H. T. The linnet has been reported also from Hawaii and Kauai.

A LIST OF THE BIRDS OF SEDGWICK COUNTY, KANSAS.

BY DWIGHT ISELY.

INTRODUCTION.

THE following paper was originally written as a summary of my observations on the habits of birds in the vicinity of Fairmount College, Wichita, Kansas, during the school year 1909-10. The work was done in connection with a course in animal ecology taken under the instruction of Austin P. Larrabee, Professor of Biology at Fairmount College.

In my observations I intended in the first place to become familiar with as many species and their habits as possible. In particular I aimed to study their migration habits and to determine the favorite environment of each bird.

Since the paper was first written I have endeavored to make as nearly as possible a complete list of the birds of Sedgwick County. With this in view I made a compilation not only of all I had noted regarding birds in my five years' residence in Wichita but also I secured records of Professor Austin P. Larrabee, Dr. R. Mathews, and Messrs. Richard H. Sullivan and Charles H. Smyth.

Professor Larrabee, head of the department of biology at Fairmount College, has lived in Wichita since September, 1909, and has kept complete notes on bird migrations since that time. Dr. Mathews has observed birds in Sedgwick County for 25 years. The late Dr. F. H. Snow of the University of Kansas has credited him with three species in his 'Catalogue of the Birds of Kansas.' Mr. Sullivan, the local weather forecaster, is president of the Kansas Audubon Society. He has kept very complete notes on bird migrations since 1905. Mr. Smyth is president of the Wichita Sportsmen's Club and has in his keeping the club records in which all the ducks shot on its reserve since 1889 are noted. To these gentlemen I am greatly indebted for the assistance they have given me.

The center of the field of my observations has been Fairmount Hill and Fairmount College campus. Fairmount Hill is a suburb of Wichita, northeast of the main part of the city, and connected with it only by a few scattering houses. Trees, mostly elms and maples, are planted along the streets and on the lawns, and there are a few small orchards. There is little shrubbery on the Hill and it is not as thickly settled as the city proper. On the college campus is a grove of maples, elms and ash trees and the so-called cedar (*Juniperus virginianus*) and a clump of cottonwoods. For the most part the trees are still small.

South of Fairmount Hill is a cemetery covering about 100 acres, planted with a mixed grove of maple, elm, coffee bean, red-bud, cedar and spruce trees. The evergreen and deciduous trees are evenly divided. In the east part of the cemetery is a pond covering several acres. About half of it is very shallow. Its banks are fringed with willows, sedges and swamp grasses.

East and north of Fairmount Hill is for the most part prairie land. A few osage oranges check these meadows. About three fourths of a mile east of Fairmount Hill is a shallow pond, known as the Reed Pond, whose borders are overgrown with cat-tails, bulrushes, willows and swamp grasses. Leading from this pond in a southerly direction is a slough which in the rainy season forms a chain of little ponds. About a mile northeast of Fairmount College is McGuinnis's Pond, which covers several acres. Leading from this pond in a northerly direction is a slough which also

forms a series of little ponds in the rainy seasons. Immediately west of the Hill is unbroken prairie land, alfalfa fields, and a few houses.

About a mile and a half north of the college is Chisolm Creek, a small sluggish stream, flowing in a westerly direction. Along the creek in this region shrubbery and a few willow and elm trees are found. At a point about two miles northwest of the Hill, Chisolm Creek turns south and flows through McKinley Park, a mile and a half west of Fairmount, which is quite well wooded. Adjoining McKinley Park is a timber lot in which there is much underbrush, and on its border is a patch of raspberries and blackberries.

The Little Arkansas River, about three miles west of Fairmount Hill, flows south through Riverside Park, which covers about 100 acres. Native timber of elms, hackberries, a few oaks and black walnuts covers the entire area but in no place is it very thick. There is some underbrush along the river on land adjoining the park.

About five miles south of the city is a timber lot of about 40 acres on the Arkansas River. This is covered with tall timber of cottonwoods, sycamores, oaks, elms, black walnuts, willows and considerable underbrush, and is the only real wooded area in the territory that was under my observation.

The majority of my field trips were to the cemetery and the adjoining prairie land. About once a month I visited the Little Arkansas River. I made two trips to the woods on the Arkansas River south of the city spending nearly a half day in each case. These trips were made April 3 and April 18.

On Oct. 24 and Oct. 25, 1909, I visited Mt. Hope, a town 25 miles northwest of Wichita. On both days I made trips along the Arkansas River near there, which is fringed with plum thickets and occasionally cottonwood trees. On the last day I visited a gun club reserve, several ponds and a prairie dog town.

Dr. Mathews and Mr. Sullivan made most of their field trips in Riverside Park and along the Little Arkansas River north of Wichita. Dr. Mathews and Mr. Smyth both hunted waterfowl on the reserve of the Wichita Sportsmen's Club four miles northeast of Mt. Hope, in the extreme northwestern portion of the county. Professor Larrabee's field of observation was nearly the same as my own.

LIST OF SPECIES.

Residents.

1. **Colinus virginianus.** BOB-WHITE.—Noted 14 times between September, 1909, and June, 1910. Most often it was seen in or near a willow copse by the cemetery. The call of the male may be frequently heard in the fields in the spring and early summer.

2. **Tympanuchus americanus.** PRAIRIE HEN.—Noted by Dr. Mathews as formerly very abundant. It has not been seen for years.

3. **Meleagris gallopavo silvestris.** WILD TURKEY.—Noted by Dr. Mathews as formerly frequent.

4. **Zenaidura macroura carolinensis.** MOURNING DOVE.—Abundant. Between April and October I have noted this species nearly every day. It is very rare in winter. Doves return in large numbers about March 15 and most of them disappear by November. In the latter part of September, 1909, I noted Mourning Doves collected in flocks of hundreds along Chisolm Creek north of Fairmount where there are but few trees along its banks.

5. **Speotyto cunicularia hypogaea.** BURROWING OWL.—One bird noted near a prairie dog town near Mt. Hope, Oct. 24, 1909.

6. **Megascops asio.** SCREECH OWL.—This species may be heard on Fairmount Hill about once in two weeks. On several occasions when I have passed through McKinley Park after nightfall I have always heard its call. On the night of May 27, 1910, I turned aside from the road and entered the park, being attracted by the calls of Screech Owls. I noted eight birds in a group, most of them young.

7. **Dryobates villosus.** HAIRY WOODPECKER.—Noted only a few times a year, in McKinley and Riverside parks. Rare.

8. **Dryobates pubescens.** SOUTHERN DOWNY WOODPECKER.—Common resident in parks and along the streets of the city in the maple trees. It is occasionally noted on Fairmount Hill. Between September, 1909, and June, 1910, I noted the species every week but two.

9. **Colaptes auratus luteus.** NORTHERN FLICKER.—Common in summer in groves and hedges. Rare in winter. Most of this species leave about Oct. 1 and return about March 15. Between these dates in 1909-10, I noted the species five times. The Flicker feeds on the ground much more than any of the other woodpeckers.

10. **Corvus corax.** AMERICAN RAVEN.—Noted by Dr. Mathews as resident in the early days.

11. **Corvus brachyrhynchos.** CROW.—Uncommon on Fairmount. Abundant in fall and winter along the Arkansas River. I have noted crows in the business part of the city picking at garbage in cans back of restaurants.

12. **Agelaius phoeniceus.** RED-WINGED BLACKBIRD.—Abundant except during the winter. A few young and females stay throughout

the winter. I noted a flock of males on Feb. 21, 1910, singing. The sexes did not associate with each other till the last of April. The latest date upon which I have noted males was Oct. 25, 1910. On May 20, 1910, I found 3 nests in willows by Reed Pond. The average height was 4 feet above the water. I have found the species most numerous around ponds, especially Reed Pond east of Fairmount.

13. *Sturnella magna*. MEADOWLARK.—Abundant in fields and prairies except during December and January when it becomes uncommon. Only once have I found this bird away from the open. That was during a severe snowstorm Nov. 29, 1909, when I found several Meadowlarks taking refuge in cedar trees. In 1910 the spring song began in full force about March 1 although heard as early as January 21.

14. *Sturnella neglecta*. WESTERN MEADOWLARK.—The only time that I saw this bird to identify it was April 28, 1910. Professor Larrabee identified two birds shot Jan. 4, 1911. I have heard its song at different times throughout the spring and summer.

15. *Quiscalus quiscula seneus*. BRONZED GRACKLE.—A very abundant summer resident in woods and fields. I have noted a few in every month of the year. It becomes abundant by the middle of March and continues so until the last of October. In the latter part of August and throughout September immense flocks collect and roost in the trees in Wichita. Mr. Sullivan has estimated their numbers to be more than 100,000. Many nest within the city.

16. *Astragalinus tristis*. GOLDFINCH.—Common on Fairmount Hill and in the cemetery. Except during the first week of April I have noted Goldfinches at least once a week between September, 1909 and June, 1910. The earliest date, a male in summer plumage, was April 8; the latest, Oct. 8. I always saw them in small flocks.

17. *Passer domesticus*. HOUSE SPARROW.—Very abundant in the city and around farm houses. Nests everywhere in the city in trees and under the eaves of houses.

18. *Cardinalis cardinalis*. CARDINAL.—Common resident. I have noted this species at least once every week between September, 1909, and June, 1910. The largest number observed on any one day was 38, on Feb. 10. They were in a double osage orange hedge, about 300 yards long, near Chisolm Creek. The Cardinal's mating song is first heard about Jan. 1. In March and April it is one of the most conspicuous songsters. In Brown County, Kansas, several years ago, I found the Cardinal nesting abundantly. All the nests were in gooseberry bushes, a few feet from the ground, and were lined with red rootlets.

19. *Mimus polyglottos*. MOCKINGBIRD.—Abundant in spring and summer on Fairmount Hill and in the cemetery. Rare in winter. I noted this species three times during the winter of 1909-10. Beginning with March, 1910, the species became numerous. In 1909 it was quite common until Oct. 20. In winter I have noted this bird only near cedar trees in the cemetery. I have seen it feeding upon cedar berries.

Every May for three years I have noted a nest in a mock orange bush in a neighbor's yard. In May, 1910, I noted a nest in a mulberry tree, on Fairmount Hill, about 10 feet above the ground.

20. **Thryothorus ludovicianus.** CAROLINA WREN.—Noted one bird Feb. 13, 1910, loudly singing in a brush pile by Chisolm Creek in McKinley Park. On March 19 and on April 7, I noted a pair in the same place. On April 16 I noted a pair in a plum thicket along the Little Arkansas River near Riverside Park. Several were seen in Riverside Park in March, 1908.

21. **Penthestes atricapillus.** CHICKADEE.—Numerous in woods along rivers. Around Fairmount I occasionally saw Chickadees but never in flocks. One nest was noted in a cottonwood stub near the Arkansas River, south of the city, April 18. I first noted the spring song in 1910, about Feb. 1.

22. **Pianesticus migratorius.** ROBIN.—Abundant except during the latter part of December and the whole of January. Between Sept. 8, 1909, and June 1, 1910, there was not a week in which I did not observe this species. With exception of the two winter months mentioned I saw Robins nearly every day. Cedar trees in the cemetery were their particular refuge in winter. They are gregarious until March 1. About this time they begin the spring song which continues until about May 1.

23. **Sialia sialia.** BLUEBIRD.—Common in the cemetery and in Riverside Park. I have never noted it in winter but it has been seen there both by Mr. Sullivan and Professor Larrabee. The latest date I have noted it is Nov. 16; earliest date, March 1. They apparently begin singing in the spring immediately after their arrival

Summer Residents.

24. **Botaurus lentiginosus.** BITTERN.—I noted a pair of these birds during April and May, 1910, at Reed Pond, east of Fairmount. The earliest date was April 12. During the summer of 1909 a pair were occasionally seen at the same place. On Oct. 18, I saw one wading in Chisolm Creek north of Fairmount.

25. **Ixobrychus exilis.** LEAST BITTERN.—Professor Larrabee identified two of this species, April 30 and May 18. Both were found with their necks broken, on the ground beneath telephone wires. Apparently they had flown into the wires at night. I noted a Least Bittern at the Reed Pond, June 4 and June 11.

26. **Butorides virescens.** GREEN HERON.—Common at ponds and along Chisolm Creek, north of Fairmount, from May to October. First date noted in 1910, May 3.

27. **Rallus elegans.** KING RAIL.—On April 19, I noted one by the Reed Pond. On June 2, I found a rail, dead, by the same pond. It had probably been killed by a hail-storm of the night before. Dr. Mathews noted that the King Rail nests here.

28. ***Porzana carolina***. SORA.— I noted one by the cemetery pond Sept. 12, 1909. Professor Larrabee noted a pair May 19 by the Reed Pond. I have seen the Sora four times in four years, by the Reed Pond, in the summer.

29. ***Fulica americana***. AMERICAN COOT.— Occasionally noted on ponds during the summer. Earliest date, April 16, 1910. Noted by Dr. Mathews as abundant in migration.

30. ***Bartramia longicauda***. UPLAND PLOVER.— Rare in summer; common in migration. I noted a flock of several hundred May 8, 1910, on an alfalfa field northeast of Fairmount. The greater number migrate southward in September. Professor Larrabee noted one Oct. 3, 1910.

31. ***Actitis macularia***. SPOTTED SANDPIPER.— Seen a few times in July, August and September, 1909. Last noted Sept. 20, wading in shallow water in the Little Arkansas River. Noted frequently in the summer by Mr. Sullivan.

32. ***Oxyechus vociferus***. KILLDEER.— Common in fields and meadows. The earliest date on which I have noted this species is Feb. 14, 1911. During the first month or six weeks after their arrival Killdeer seem to spend a large part of their time in courtship. The male will fly back and forth over a field giving its cry sometimes for over an hour without intermission. After this period they are less noisy and conspicuous. A Killdeer has been noted as late as Nov. 10, 1910, by Professor Larrabee.

33. ***Cathartes aura septentrionalis***. TURKEY VULTURE.— Noted a few times every summer. I saw it as late as Nov. 23 in 1909, and as early as Feb. 25 in 1910.

34. ***Buteo borealis krideri***. KRIDER'S HAWK.— Rare. This bird I have seldom noted near the city. The earliest date is April 18; the latest, Oct. 8, 1909.

35. ***Aluco pratincola***. BARN OWL.— One pair noted by Dr. Mathews, nesting. Noted by Mr. Sullivan in May, August and October.

36. ***Coccyzus americanus***. YELLOW-BILLED CUCKOO.— A common summer resident. I have noted it before June 1 or after September 1. I have found it almost anywhere where there are trees.

37. ***Coccyzus erythrophthalmus***. BLACK-BILLED CUCKOO.— Dr. Mathews has found one Black-billed Cuckoo's nest.

38. ***Ceryle alcyon***. BELTED KINGFISHER.— Uncommon. April 16 is the earliest date upon which I have noted it. It may be seen throughout the summer along the Little Arkansas River, and I have noted it on Chisolm Creek.

39. ***Melanerpes erythrocephalus***. RED-HEADED WOODPECKER.— A common resident of Riverside Park and of the trees along the city streets. This bird seems to be more fond of telephone poles and dead trees than any other of the woodpeckers. Noted as early as April 8 by Mr. Sullivan. My latest date is Sept. 23 in 1909.

40. ***Centurus carolinus***. RED-BELLIED WOODPECKER.— Noted

April 7, and May 20, 1910, in McKinley Park. Dr. Mathews found a pair nesting near the city in the summer of 1902.

41. **Antrostomus vociferus.** WHIP-POOR-WILL.—Noted by Dr. Mathews as seen occasionally in summer.

42. **Chordeiles virginianus.** NIGHTHAWK.—Common in summer; abundant during September migration. First noted in 1910, May 8. Last noted in 1909, Oct. 12.

43. **Chaetura pelagica.** CHIMNEY SWIFT.—Common in the city. First noted in 1910, May 9; last noted in 1909, October 12. Many of them roost in the unused chimneys on Fairmount college.

44. **Archilochus colubris.** RUBY-THROATED HUMMINGBIRD.—Rare. I see it a few times during a summer.

45. **Muscivora forficata.** SCISSOR-TAILED FLYCATCHER.—Noted one bird June 22, 1907. Dr. Mathews notes this species as rare but increasing. It is said by Garner Taylor to be quite common a few miles south of Wichita.

46. **Tyrannus tyrannus.** KINGBIRD.—Common in groves and along fences. In 1910 the first date on which I noted the species was April 30. The last date in 1909 was Sept. 15. Kingbirds decrease in numbers in August.

47. **Myiarchus crinitus.** CRESTED FLYCATCHER.—Common in the tree-tops of Riverside Park throughout the early summer. The earliest date on which I have noted this species is May 1, in 1910.

48. **Sayornis phoebe.** PHOEBE.—Common by bridges, under which I have noted several nests. In Brown County, Kansas, I once found a nest in a cattle barn. Two sets of eggs were laid in it but both were destroyed and at last the nest was abandoned by the Phœbes. It was immediately occupied by English Sparrows when the first owners left it. The Phœbe disappears early in the summer. The earliest date upon which I have noted it is March 4, 1910.

49. **Myiochanes virens.** WOOD PEWEE.—Common throughout the summer in Riverside Park. It continues its song later into the summer than do most birds. Mr. Sullivan has noted it as early as March 17; his latest date is September 11.

50. **Empidonax virescens.** ACADIAN FLYCATCHER.—Dr. Mathews saw a pair building a nest in Riverside Park in the summer of 1902.

51. **Cyanocitta cristata.** BLUE JAY.—Abundant in Riverside Park; common on Fairmount Hill and in the cemetery. First noted on April 16 in 1910. It was common in the fall of 1909 until October and was last noted on the 12th of that month.

52. **Molothrus ater.** COWBIRD.—Common in spring and summer and abundant in fall. The earliest date upon which I noted this species was March 16 in 1910. In the fall of 1909 I saw it as late as Nov. 15. Like the Grackles the Cowbird follows the plow in spring and feeds upon grubs.

53. **Icterus spurius.** ORCHARD ORIOLE.—Common in the trees

along the streets, in the cemetery and in Riverside Park. The earliest date upon which I have noted this species was May 8, in 1910. They begin to be less numerous about Aug. 1.

54. *Icterus galbula*. BALTIMORE ORIOLE.—A common tree bird along the city streets, in the cemetery and Riverside Park. The first date upon which I have noted this species was April 30, in 1910. It becomes rare about two weeks later than the Orchard Oriole. I have often seen this bird robbing the pea patch in the garden.

55. *Passerherbulus lecontei*. LECONTE'S SPARROW.—A very common prairie bird. The earliest date, March 28, in 1910. The species is quite conspicuous in the early part of the summer when its cricket-like song can be heard on the prairie, especially at twilight. It was noted as late as Oct. 3 by Professor Larrabee, in 1910.

56. *Chondestes grammacus*. LARK SPARROW.—A common prairie bird often found near ponds. It was first noted April 4 in 1910, and last seen Oct. 8 in 1909.

57. *Spizella passerina*. CHIPPING SPARROW.—Uncommon on Fairmount Hill and in the cemetery. Noted first May 4 in 1910. I see this species a few times every summer.

58. *Spizella pusilla*. FIELD SPARROW.—I have seen this bird a few times in the cemetery and in the open woods in Riverside Park. The earliest date is March 27, 1910. In Brown County, Kansas, where the species was abundant, the hedges were a favorite cover at night. The Field Sparrow there had a habit of singing at any time of the night.

59. *Pipilo erythrophthalmus*. TOWHEE.—Common in April and May in the underbrush by the Little Arkansas River. First noted, a pair, April 7, 1910, in McKinley Park. The latest I have seen this species is Oct. 25, 1909.

60. *Zamelodia ludoviciana*. ROSE-BREADED GROSBILL.—Rare. Noted four times in four years, in Riverside Park, where Dr. Mathews found it nesting in the summer of 1902.

61. *Passerina cyanea*. INDIGO BUNTING.—Uncommon. Noted occasionally in the tall timber in Riverside Park and McKinley Park. The earliest date, May 1, 1910.

62. *Spiza americana*. DICKCISEL.—Abundant on the prairies during the spring and summer. During the hottest summer days these birds are very conspicuous on the tall prairie weeds, and on the fences and telephone wires, singing. They begin to be less numerous by August. The earliest date of arrival noted was May 8, in 1910. The latest seen was Sept. 25, 1909. The Dickcissel is very fond of water, and I have often noted it wading in shallow ponds.

63. *Piranga erythromelas*. SCARLET TANAGER.—Noted July 1, 1909, in Riverside Park. Three have been noted at different times by Dr. Mathews.

64. *Progne subis*. PURPLE MARTIN.—Common in the business part of the city, where several hundred pairs nest every summer. The earliest

date on which I have noted it was March 24 in 1910. Mr. Sullivan has noted Martins as early as March 11. They begin to migrate southward by August 1.

65. *Petrochelidon lunifrons*. CLIFF SWALLOW.—Common. Noted between May 1 and September 22. In the early part of September, both of 1907 and 1908, I saw a continuous stream of these birds flying southward. They did not move in a compact flock like Blackbirds but were scattered from horizon to horizon, and were several days in passing.

66. *Hirundo erythrogastra*. BARN SWALLOW.—Common from the latter part of April until the middle of September. These birds are seen most frequently flying over ponds or around cattle. I have found a number of nests in a hay shed on the prairie east of Fairmount.

67. *Iridoprocne bicolor*. TREE SWALLOW.—Dr. Mathews has noted two pairs nesting in the city.

68. *Riparia riparia*. BANK SWALLOW.—Noted by Mr. Sullivan during the summers of 1908 and 1909. Also by Dr. Mathews.

6. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—Common. Noted most frequently on fences or trees in the open. The earliest date on which I have seen it was Feb. 28; the latest, Sept. 26. On May 17 I found a nest containing six eggs on the Fairmount College campus in an elm sapling, about eight feet from the ground.

70. *Vireosylva olivacea*. RED-EYED VIREO.—A common summer resident, singing in the trees along the city streets. It is one of the most persistent songsters during the hot weather, keeping up its song even into August. The earliest date upon which it was noted was May 8, by Professor Larrabee.

71. *Vireosylva gilva*. WARBLING VIREO.—A common singer in the trees along the street and in the cemetery during the first half of May. The species becomes less common during the latter part of spring and I have never noted it after July.

72. *Vireo griseus*. WHITE-EYED VIREO.—Uncommon. I have found this species most frequently along hedges and in evergreen trees. The earliest date, May 11, in 1910; the latest, Sept. 12, in 1909.

73. *Dendroica aestiva*. YELLOW WARBLER.—Abundant during the spring migration and common throughout the summer. I have found this species in trees along the streets, in the cemetery and parks. May 1, 1910, is the earliest date upon which I have noted the species.

74. *Geothlypis trichas occidentalis*. WESTERN YELLOW-THROAT.—A common bush bird in spring and early summer. The earliest date on which I noted this species was May 1, 1910. Noted in underbrush, by cemetery Pond, Chisolm Creek and Little Arkansas River. During May and June it sings almost constantly.

75. *Icteria virens*. YELLOW-BREASTED CHAT.—Noted by Dr. Mathews as common.

76. *Dumetella carolinensis*. CATBIRD.—Common in spring. The earliest date on which I have noted the species was May 8, 1910; the latest

was Oct. 3, 1909. On May 24, 1910, I found a nest with four eggs, in a dwarfed cedar tree in the cemetery, about 2 feet from the ground. The Catbird is most numerous in the underbrush along the Little Arkansas River. Throughout May and June they are among the most noticeable songsters. Later in the summer and in the fall I have heard their song from a thicket but it was very quiet, and the birds were very shy.

77. **Toxostoma rufum.** BROWN THRASHER.— Abundant from May 1 to Oct. 1. The earliest date on which I noted this species was April 12, in 1910; the latest was Oct. 9, in 1909. This bird is found in large numbers all over the city, and in the parks. Its nests are very abundant in osage orange hedges. In May and June the old birds, followed by the young, may be seen on the lawns everywhere, pulling worms out of the ground. They feed also in the fields and a few follow the plow.

78. **Thryomanes bewickii cryptus.** TEXAS BEWICK'S WREN.— One bird noted May 17, 1910, in an orchard on Fairmount Hill. This bird was singing. During the first two weeks of May, 1909, a pair of these birds sang around a neighbor's house and started to build a nest in a bird box. They were apparently driven away by a House Wren.

79. **Telmatodytes palustris.** LONG-BILLED MARSH WREN.— Noted by Dr. Mathews as frequent.

80. **Hyllocichla mustelina.** WOOD THRUSH.— Common in the cemetery and the parks. Arrive about the middle of May. The last date I noted this species in 1909 was Sept. 20. After Aug. 1, the species becomes very shy and rare. On May 19, 1910, I found a nest in a peach tree about six feet above the ground, in an orchard on Fairmount Hill.

Winter Sojourners.

81. **Circus hudsonius.** MARSH HAWK.— Common. Noted about once a week from Oct. 9, 1909, until April 1, 1910, flying low over the prairies east and north of Fairmount.

82. **Buteo borealis.** RED-TAILED HAWK.— A pair has stayed in a pasture near Chisolm Creek, north of Fairmount, for several winters. In 1909 they were first noted Oct. 3, and were last seen March 16, 1910. A few scattering trees furnish perches for them.

83. **Buteo swainsoni.** SWAINSON'S HAWK.— Noted only occasionally during the winter, near the timber along the rivers. Sometimes I have seen them in flocks of 15 to 20. Mr. Sullivan noted a flock of these hawks, numbering 271, Oct. 1, 1909.

84. **Falco sparverius.** SPARROW HAWK.— Common. Noted along fences in the open and often in the city. In the fall of 1909 it was first seen Oct. 12; last noted in the spring of 1910, April 28.

85. **Sphyrapicus varius nuchalis.** RED-NAPED SAPSUCKER.— Noted by Mr. Sullivan, Dec. 23, 1910, and by Mr. Sullivan and Professor Larrabee, Feb. 10, 1911. On both occasions the species was seen in the woods along the Little Arkansas River, north of Wichita.

86. *Colaptes cafer collaris*. RED-SHAFTED FLICKER.—Noted one bird Feb. 18, 1910; noted another Dec. 17, 1910, and a pair Feb. 3, 1911. Noted also by Mr. Sullivan and Professor Larrabee.

87. *Otocoris alpestris leucolæma*. DESERT HORNE LARK.—Common. During snow storms it is abundant, coming in flocks of hundreds. In 1909 I noted them as early as Sept. 25. The following spring they became rare during the first part of April, although I noted one bird as late as May 8. Most frequently found along open ravines north and east of Fairmount. Sometimes I have seen a Horned Lark sitting on a post to sing but never on a wire or in a tree. I do not believe that their feet can grasp a round object. The Horned Lark is one of our earliest singers, beginning about the middle of January. From that time until they migrate northward their song can be heard nearly every evening on the prairie. In Brown County, Kansas, where the Horned Lark is resident, twice I found nests on crests of corn ridges. They were mere hollows in the earth with no lining. Each nest contained five eggs.

88. *Spinus pinus*. PINE SISKIN.—Abundant in cedar trees in the cemetery, during the winters of 1906-07, 1907-08, 1908-09. I have not seen these birds since. Professor Larrabee noted a small flock in the cemetery March 9, 1911.

89. *Zonotrichia querula*. HARRIS'S SPARROW.—An abundant bush bird, very abundant during the spring migration. The first date upon which I noted the species in the fall of 1909 was Oct. 13. The following spring the last were noted May 14. Harris's Sparrows become abundant by Oct. 25. During March and April I believe that they are the most numerous birds in this vicinity. I have found them most numerous along thick osage orange hedges. About March 1, they begin to sing in chorus. I have counted several hundred in large flocks in which a large part of the birds were singing at the same time.

90. *Spizella monticola*. TREE SPARROW.—Abundant. First noted in 1909, Oct. 24, in the plum thickets by the Arkansas River near Mount Hope. In the following spring it was last noted March 12. The Tree Sparrow is a frequent dooryard visitor, coming to pick up crumbs. As far as I have observed it is an open bush bird and is never found in thick woods. It is a great weed seed eater.

91. *Junco hyemalis*. SLATE-COLORED JUNCO.—Abundant. In 1909 I first noted this species on Oct. 13, and in the following spring I last noted it April 12. On almost any day between those dates Juncos could be seen in the cemetery and on Fairmount Hill. I have found them most numerous around the cedar trees in the cemetery, and like the Tree Sparrow the Junco is a frequent dooryard visitor. They are more abundant during stormy weather, when they come in flocks of thousands. Juncos begin singing in the middle of March.

92. *Melospiza melodia*. SONG SPARROW.—Common in the fall, rare in midwinter, and abundant in the spring migration. In 1909 I first noted this species Oct. 2. It became abundant in October and re-

mained so until the last of December. On March 5, 1910, Song Sparrows suddenly became abundant and continued so until the middle of April. The last of the species was noted May 8. The favorite haunts of this bird are the shrubbery, tall grass and weeds by the ponds and Chisolm Creek. It is curious to note, however, that Song Sparrows were common in the tall weeds by the cemetery pond in the fall of 1909 when the pond was entirely dry. I have heard the song of this bird during its entire stay in this region, but it was more common in the spring.

93. *Ampelis cedrorum*. CEDAR WAXWING.—I have noted a flock in the cemetery every winter for five years. They are very erratic in their migrations. In the fall of 1909 I first noted the species Nov. 23; in 1910 I first noted them Nov. 2; in the fall of 1908 they did not appear at all but came in January, 1909. In 1910, they disappeared Feb. 15 until March 20, when they became numerous for two days and then left.

94. *Lanius borealis*. NORTHERN SHRIKE.—I have noted this species at least once every year for five winters. The earliest date was Oct. 24, in 1909. I have always found it in the open, on telephone wires or fences.

95. *Dendroica coronata*. MYRTLE WARBLER.—Abundant in the cemetery during warm winter weather. During the winter of 1909–10 these warblers disappeared entirely during stormy periods. I noted them irregularly from Nov. 6, 1909, to April 17, 1910.

96. *Anthus rubescens*. AMERICAN PIPIT.—Abundant during February and March, 1910, in prairies and pastures. I first noted this species Jan. 29, 1910. After that I often flushed flocks of hundreds from prairies. Apparently they had migrated by the middle of April, but I flushed a large flock in a wheat field, north of Chisolm Creek, May 8. They were especially numerous in fields overgrown with crab-grass.

97. *Tannus hiemalis*. WINTER WREN.—Noted by Mr. Sullivan between Oct. 26 and Feb. 27.

98. *Certhia familiaris americana*. BROWN CREEPER.—One noted Jan. 18, 1911, in Riverside Park. Noted also by Mr. Sullivan.

99. *Sitta carolinensis*. WHITE-BREADED NUTHATCH.—Noted a single bird in a maple tree near the business part of the city, calling loudly, Feb. 25, 1911. Noted by Mr. Sullivan, Jan. 11, 1909. Noted by Professor Larrabee, March 11, 1911.

100. *Myadestes townsendi*. TOWNSEND'S SOLITAIRE.—I have noted a pair near the evergreens in the cemetery every winter for five years. It sometimes feeds on the ground but will fly to a tree almost as soon as it is observed. I have seen Solitaires eating cedar berries. On Jan. 24, 1910, I noted a Solitaire in Riverside Park.

Migrants.

101. *Podilymbus podiceps*. PIED-BILLED GREBE.—Noted by Dr. Mathews as common.

102. *Larus argentatus*. HERRING GULL.—Noted by Dr. Mathews.

In Brown County, Kansas, I noted a solitary Herring Gull on May 4, following a corn lister, picking up grubs like the Blackbirds.

103. *Larus delawarensis*. RING-BILLED GULL.—Noted in the latter part of 1908 feeding with Blackbirds on plowed land east of Fairmount Hill.

104. *Larus franklini*. FRANKLIN'S GULL.—One noted April 30 and May 4, 1910, flying north.

105. *Sterna hirundo*. COMMON TERN.—Noted by Dr. Mathews as a frequent migrant.

106. *Hydrochelidon nigra surinamensis*. BLACK TERN.—On Sept. 9, 1909, I identified one shot by Mr. C. C. Whitaker, which he said was one of a flock. In 1910 I noted a flock of 7, and on May 22 two birds. On both occasions they were flying north. Professor Larrabee noted a Black Tern Oct. 9, 1909.

107. *Pelecanus erythrorhynchos*. WHITE PELICAN.—Noted by Dr. Mathews and Mr. Sullivan.

108. *Merganser americanus*. AMERICAN MERGANSER.—Noted by Dr. Mathews.

109. *Merganser serrator*. RED-BREASTED MERGANSER.—Noted by Dr. Mathews.

110. *Lophodytes cucullatus*. HOODED MERGANSER.—Noted by Dr. Mathews.

111. *Anas platyrhynchos*. MALLARD.—Noted six Mallards, shot at a Mt. Hope gun club, Oct. 25, 1909. During the spring of 1911, I noted Mallards shot by hunters, on several occasions. The earliest was Feb. 4. Mr. Smyth has noted that they are among the first of the ducks to arrive in the spring migration, often arriving by Feb. 1. In the fall they arrive about Oct. 1. He said regarding their feeding habits: "Mallards often leave water and go into the fields and feed all night. I have seen them sitting on kafir-corn shocks like Prairie Chickens. On one occasion two others and myself shot 55 Mallards while standing in a kafir corn shock."

112. *Chaulelasmus streperus*. GADWALL.—Noted by Dr. Mathews and Mr. Smyth.

113. *Mareca americana*. BALDPATE.—Noted several shot at the gun club near Mt. Hope, Oct. 24 and 25, 1909. Mr. Smyth has noted that this species begins to be common on the ponds about Oct. 10 in the fall, and March 10 in the spring.

114. *Nettion carolinense*. GREEN-WINGED TEAL.—I noted a flock of several hundred Green-winged and Blue-winged Teal on the Arkansas River near Mt. Hope, Oct. 25, 1909. This species, according to Mr. Smyth, arrives soon after the middle of September and stays in the country until the ponds freeze over. In the northward migration it returns during the early part of February.

115. *Querquedula discors*. BLUE-WINGED TEAL.—Noted with the preceding species on the Arkansas River, near Mt. Hope, Oct. 25, 1909. On May 11, 1910, I noted a pair on the cemetery pond. This duck is the

first to arrive in the fall and the last to go north in the spring. Mr. Smyth has shot Blue-winged Teal as early as Aug. 25.

116. *Querquedula cyanoptera*. CINNAMON TEAL.—Noted by Dr. Mathews as very rare.

117. *Spatula clypeata*. SHOVELLER.—Noted by Dr. Mathews and Mr. Smyth.

118. *Dafila acuta*. PINTAIL.—Noted a flock of 8 on McGuinnis's Pond Feb. 20, 1910. Mr. Smyth has noted that Pintails begin to arrive going southward about Oct. 20 and returning northward about Feb. 5. In 1891 he shot several of this species as nearly as Jan. 27.

119. *Aix sponsa*. WOOD DUCK.—I noted a pair on the cemetery pond April 25 and 26, 1910. Noted occasionally by Mr. Smyth, Dr. Mathews, and Mr. Sullivan.

120. *Marila valisineria*. CANVAS-BACK.—Noted by Mr. Smyth as being common in the fall after Oct. 20 and in the spring after March 1.

121. *Marila americana*. RED-HEAD.—Noted by Mr. Smyth as migrating with the Canvas-back. Common.

122. *Marila collaris*. RING-NECK.—Noted by Dr. Mathews.

123. *Marila marila*. SCAUP DUCK.—Noted by Mr. Smyth as common in the fall about Oct. 20 and in the spring about March 20.

124. *Marila affinis*. LESSER SCAUP DUCK.—Noted by Dr. Mathews.

125. *Charitonetta albeola*. BUFFLE-HEAD.—Noted by Mr. Sullivan.

126. *Erismatura jamaicensis*. RUDDY DUCK.—Noted by Mr. Smyth as common on the streams about Oct 15. They return in smaller numbers in the spring.

127. *Chen hyperboreus*. LESSER SNOW GOOSE.—March 15, 1911, I noted a flock of about 150, flying northward over Fairmount, about 50 feet high. Mr. Smyth has noted this species as a winter visitor during the warm days.

128. *Chen caerulescens*. BLUE GOOSE.—Noted by Dr. Mathews.

129. *Anser albifrons gambeli*. WHITE-FRONTED GOOSE.—Noted by Dr. Mathews as frequent but decreasing.

130. *Branta canadensis*. CANADA GOOSE.—Noted flocks Oct. 13, 1909, and Feb. 5 and Feb. 27, 1910. In other years I have noted this species during every winter month. I believe that this goose flies into this region occasionally on warm winter days.

131. *Branta canadensis hutchinsi*. HUTCHINS'S GOOSE.—Noted by Dr. Mathews.

132. *Branta bernicla glaucogastra*. BRANT.—Noted by Mr. Smyth as migrating southward about Oct. 15 and northward about March 15.

133. *Olor columbianus*. WHISTLING SWAN.—Noted by Mr. Smyth and Dr. Mathews.

134. *Ardea herodias*. GREAT BLUE HERON.—I noted a pair wading in Chisolm Creek, north of Fairmount college, May 8, 1910.

135. *Grus americana*. WHOOPING CRANE.—Noted as frequent by Dr. Mathews.

136. *Grus canadensis*. LITTLE BROWN CRANE.—Noted as frequent by Dr. Mathews.

137. *Grus mexicana*. SANDHILL CRANE.—Noted as frequent by Dr. Mathews.

138. *Rallus virginianus*. VIRGINIA RAIL.—Noted by Dr. Mathews.

139. *Gallinago delicata*. WILSON'S SNIFE.—Noted as abundant by Dr. Mathews. Mr. Smyth has bagged snipe as early as Sept. 14, and has noted them migrating northward commonly on April 15.

140. *Pisobia maculata*. PECTORAL SANDPIPER.—I noted several at the cemetery pond during April, 1909. Noted as abundant by Dr. Mathews.

141. *Pisobia minutilla*. LEAST SANDPIPER.—Very common, wading in the borders of the cemetery pond during April, 1909. I often saw as many as 6 in a group.

142. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Noted by Dr. Mathews.

143. *Totanus flavipes*. YELLOW-LEGS.—Noted by Dr. Mathews.

144. *Helodromas solitarius*. SOLITARY SANDPIPER.—Common. Noted in the fall of 1909 between September 9 and September 26, and in the spring of 1910 between April 17 and May 17, and in the fall of 1910 between Aug. 28 and Sept. 15. The largest number that I have observed in one day is 14, which I saw at intervals wading in Chisolm Creek on May 8, 1910.

145. *Catophorus semipalmatus inornatus*. WESTERN WILLET.—Noted by Dr. Mathews.

146. *Numenius longirostris*. LONG-BILLED CURLEW.—Noted by Dr. Mathews.

147. *Numenius hudsonicus*. HUDSONIAN CURLEW.—Noted as common by Dr. Mathews.

148. *Accipiter cooperi*. COOPER'S HAWK.—Noted Oct. 1, 1908, and Sept. 19, 1909, by Mr. Sullivan. In one case the bird was flying around in the business part of the city.

149. *Buteo lineatus*. RED-SHOULDERED HAWK.—Mr. Sullivan noted a flock of this species, Oct. 1, 1908, numbering 180, and several small flocks in the fall of 1909.

150. *Falco mexicanus*. PRAIRIE FALCON.—I noted one perched on a lower branch of an elm tree in the cemetery, April 25, 1909.

151. *Asio wilsonianus*. LONG-EARED OWL.—Noted one in the cemetery, April 19 and April 24, 1910, taking refuge in cedar trees.

152. *Asio flammeus*. SHORT-EARED OWL.—Noted one in a ravine east of the cemetery, March 16, 1910.

153. *Strix varia*. BARRED OWL.—A flock of six of these owls stayed nearly a week in the cemetery during March, 1909. In the daytime they hid in cedar trees.

154. *Empidonax minimus*. LEAST FLYCATCHER.—One noted in a clump of willows in Riverside Park, May 1, 1910, and another in a locust hedge in the cemetery, May 17, 1910.

155. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD.—On Sept. 23, 1909, I noted a flock of 7, and another flock of about 20, April 28, 1910.

156. *Euphagus cyanocephalus*. BREWER'S BLACKBIRD.—Throughout the whole of September and the first two weeks of October, 1909, this species was abundant. The last date upon which I observed it was Oct. 18. In the spring of 1910 one flock was reported by Mr. Larrabee April 28. In September, 1910, I noted but one small flock. During the fall of 1909 these birds were always in large flocks and were either in kafir-corn fields or in cottonwood trees.

157. *Poocetes gramineus*. VESPER SPARROW.—Two birds were noted by Professor Larrabee in the prairie grass by the slough east of Fairmount.

158. *Ammodramus savannarum australis*. GRASSHOPPER SPARROW.—Noted by Dr. Mathews as common.

159. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW.—On Oct. 18, 1909, I counted 14 of these birds in the scattered shrubbery along Chisolm Creek north of Fairmount. On May 9, 1910, I saw one in an orchard on Fairmount Hill.

160. *Spizella pallida*. CLAY-COLORED SPARROW.—A common spring migrant, noted nearly every day between April 30 and May 17, 1910, on Fairmount Hill and in the cemetery. It was nearly always in small flocks.

161. *Peucaea cassinii*. CASSIN'S SPARROW.—Noted by Professor Larrabee several times in the spring of 1910. The earliest date was April 26.

162. *Passerella iliaca*. FOX SPARROW.—Noted by Mr. Sullivan during the months of November, January, February, and May.

163. *Vireo belli*. BELL'S VIREO.—Noted by Dr. Mathews as frequent.

164. *Vermivora peregrina*. TENNESSEE WARBLER.—Noted by Professor Larrabee, Oct. 10 and 11, one bird being seen in the cemetery and the other in a hedge east of Fairmount.

165. *Setophaga ruticilla*. REDSTART.—Noted by Dr. Mathews.

166. *Baeolophus bicolor*. TUFTED TITMOUSE.—Common in the woods along the Arkansas River south of Wichita, April 18, 1910. The birds were very noisy and sang a great deal. It was also seen by Mr. Sullivan and Professor Larrabee March 19, 1911.

167. *Polioptila caerulea*. BLUE-GRAY GNATCATCHER.—Eight birds noted April 18, 1910, in the tall timber by the Arkansas River south of Wichita. Most of the time they stayed high in the trees and were very noisy.

168. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.—

Common spring migrant. Noted between May 4 and 17, 1910, nearly every day, on Fairmount Hill and in the Cemetery. On May 17 I counted 82 of this species feeding on the ground in the cemetery. This was by far the largest number that I have ever seen in any one day.

Occasional Visitors.

169. *Aechmophorus occidentalis*. WESTERN GREBE.—Dr. Mathews noted one killed on the Little Arkansas River in 1887.

170. *Colymbus nigricollis californicus*. EARED GREBE.—Dr. Mathews has noted this species two different years.

171. *Gavia immer*. LOON.—Two birds noted by Dr. Mathews.

172. *Phalacrocorax auritus*. DOUBLE-CRESTED CORMORANT.—One known to Dr. Mathews.

173. *Pelecanus occidentalis*. BROWN PELICAN.—One bird noted by Mr. Sullivan April 25, 1910, flying north.

174. *Anas rubripes*. BLACK DUCK.—Two specimens, identified by Dr. Mathews.

175. *Clangula clangula americana*. GOLDEN-EYE.—Three noted by Dr. Mathews.

176. *Harelda hyemalis*. OLD SQUAW.—Dr. Mathews has identified three of this species.

177. *Oidemia perspicillata*. SURF SCOTER.—One specimen, identified by Mr. Sullivan and Dr. Mathews. The bird was shot Oct. 23, 1910.

178. *Plegadis guarauna*. WHITE-FACED GLOSSY IBIS.—Noted three times by Dr. Mathews.

179. *Ajaia ajaja*. ROSEATE SPOONBILL.—One killed by Dr. Mathews in 1900.

180. *Herodias egretta*. GREAT WHITE EGRET.—One specimen, identified by Dr. Mathews in 1891.

181. *Egretta candidissima*. SNOWY EGRET.—Noted by Dr. Mathews during the summer of 1891.

182. *Florida cærulea*. LITTLE BLUE HERON.—Noted by Mr. Sullivan during the summer of 1907 along the Little Arkansas River.

183. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON.—Dr. Mathews saw a flock of young during the summer of 1891. He has noted but one mature bird in this county.

184. *Gallinula galeata*. FLORIDA GALLINULE.—One bird noted by Dr. Mathews in 1898 and another in 1899.

185. *Steganopus tricolor*. WILSON'S PHALAROPE.—A pair were brought to Dr. Mathews that are now in his collection.

186. *Recurvirostra americana*. AVOCET.—Three specimens are known to Dr. Mathews to have been taken in the county.

187. *Philohela minor*. WOODCOCK.—One noted by Dr. Mathews in 1887, and one by Professor Larrabee Oct. 3, 1910.

188. *Macrorhamphus scolopaceus*. LONG-BILLED DOWITCHER.—One was brought to Dr. Mathews.

189. *Squatarola squatarola*. BLACK-BELLIED PLOVER.—One was identified by Dr. Mathews.

190. *Charadrius dominicus*. AMERICAN GOLDEN PLOVER.—Noted by Dr. Mathews.

191. *Ictinia mississippiensis*. MISSISSIPPI KITE.—One noted by Dr. Mathews.

192. *Accipiter velox*. SHARP-SHINNED HAWK.—Noted by Dr. Mathews.

193. *Aquila chrysaetos*. GOLDEN EAGLE.—Noted by Dr. Mathews and Mr. Sullivan.

194. *Haliaeetus leucocephalus*. BALD EAGLE.—Noted by Dr. Mathews.

195. *Falco columbarius*. PIGEON HAWK.—One killed by Dr. Mathews in December, 1901.

196. *Pandion haliaetus carolinensis*. OSPREY.—One shot by Dr. Mathews in 1892.

197. *Nyctea nyctea*. SNOWY OWL.—One shot by Dr. Mathews in 1891.

198. *Antrostomus carolinensis*. CHUCK-WILLS-WIDOW.—A bird captured by Dr. Mathews was submitted to Dr. F. H. Snow of the University of Kansas for identification, and is mentioned by Dr. Snow in his 'Catalogue of the Birds of Kansas.'

199. *Dolichonyx oryzivorus*. BOBOLINK.—One flock noted by Dr. Mathews.

200. *Euphagus carolinus*. RUSTY BLACKBIRD.—Noted by Dr. Mathews in the winter of 1901-02.

201. *Hesperiphona vespertina montana*. WESTERN EVENING GROSBEEK.—One noted by Dr. Mathews.

202. *Loxia leucoptera*. WHITE-WINGED CROSSBILL.—A small flock was twice noted by Mr. Sullivan in the fall of 1910.

203. *Plectrophenax nivalis*. SNOW BUNTING.—Noted by Mr. Sullivan Feb. 24, 1910.

204. *Junco hyemalis connectens*. SHUFELDT'S JUNCO.—One was noted by Professor Larrabee, March 6, 1911.

205. *Guiraca caerulea*. BLUE GROSBEEK.—Mr. Sullivan noted a pair June 3, 1910.

206. *Passerina ciris*. PAINTED BUNTING.—Noted one male May 17, 1907, in a blackberry briar patch in the north part of the city. One was noted by Dr. Mathews in 1887.

207. *Ampelis garrulus*. BOHEMIAN WAXWING.—A single bird in Dr. Mathew's collection was found by Garner Taylor in the cemetery one early spring morning after a hail storm, in 1904.

208. *Seiurus aurocapillus*. OVEN-BIRD.—One bird was noted by Dr. Mathews in Riverside park, June 8, 1902.

Summary.

Residents	23
Summer Residents	57
Winter Sojourners	20
Migrants	68
Occasional Visitors	40
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Total	208

NOTES ON RECOGNITION MARKS IN CERTAIN SPECIES OF BIRDS.

BY JOHN TREADWELL NICHOLS.

IN 'Bird-Lore' for December, 1901, Ernest Thompson Seton published an article on recognition marks in animals. The subject has interested me ever since, and I have tried to explain by that hypothesis some of their colors as seen in the field.

It is frequently urged that the build, motions, and general appearance of a bird are what we, and doubtless also its associates, use in recognizing it. This certainly is often true; but on careful analysis, it is found that in many species it is some definite, conspicuous bit of color which catches the eye and gives them away. It is the dark back, sharp breast line and white outer tail feathers that demonstrate the Junco in the sparrow-filled shrubbery. A year ago this summer I had my first meeting with the Bohemian Waxwing in the Canadian Rockies. Of course we all know the chestnut under tail-coverts of this species are a conspicuous mark with the bird in the hand, but I was surprised to find how conspicuous they were in the field. As the birds took flight they were very noticeable, and this mark which so definitely separated the species from the allied Cedar Waxwing common in the same region, is doubtless of use to the birds themselves as well as to the human observer.

But aside from these one or two land birds, I wish to speak particularly of two groups of water birds,—the Albatross-Petrel group and the Shore Birds. Some years ago I spent some time studying the first at sea in the southern hemisphere where many species abound. The habit of life of all is similar. They fly constantly about close to the ocean surface looking for food. Often they must go some time without food, and doubtless when they do find it, it is as frequently in superabundance,—perhaps a school of fish, or squid, or a dead whale. Then they gather from all about to the feast. They have few enemies. Obviously a strong advertising coloration would be of advantage to such birds, coupled with recognition marks, as the food of the different species would be somewhat different. I found that the definite color patterns of the different species were most useful in separating them. The black and white Cape Pigeon has a color pattern at once conspicuous and diagnostic, differentiating it at any distance from the numerous petrels of similar size and flight found in the same regions. The gray-backed Slender-billed Fulmar has a light patch on the wing which is conspicuous and diagnostic when the bird is in flight. In southern seas there are many petrels of about the size of a Cape Pigeon, dark above and white below, with dark under surfaces to the wings, whose plumage differs only in minor details. The feeding habits of the different species are doubtless alike, as they all follow a ship but rarely take a baited hook, which the Cape Pigeon and Slender-billed Fulmar do greedily, and which accounts for the disproportionate abundance of these two species in collections. Apparently the general type of color mentioned is a recognition mark shared by a number of species of similar habits. That this is true is made more probable by the fact that a markedly different type of plumage characterizes one or more species of petrels of about the same size and appearance otherwise but of quite different feeding habits which were observed at a distance or near to, going about their business, often in flocks and not coming about or paying attention to the ship. They had a great deal of white on the under surfaces of the wings, and the white of the breast running up towards the nape, marking off the dark top of the head from the remainder of the dark upper parts. Very probably part of them at least were the Greater Shearwater,

a species which should have been in southern waters at the season when they were observed there. When one was seen at a distance it was recognized at once by its striking color scheme, and I knew that though its course might lie across that of the ship it would not come about or follow her.

Then there are small albatrosses resembling one another in size and doubtless in feeding habits, belonging to *Diomedea* and *Thalassogeron*, collectively called "Molly-hawk" by sailors. They have the same type of coloration, white with a blackish mantle solid across the back, whereas the large Albatross *Diomedea exulans*, which has somewhat different habits on account of its much greater size, has the center of the back white. Although the large Albatross is of quite different build from the smaller ones, at long and uncertain range this difference of pattern was found to be the readiest and surest way of identifying it.

The sailing flight characteristic of petrels and albatrosses, in which the bird glides inclined first to one side, then to the other, displays particularly well the patterns of both upper and lower surfaces. The white rump of the Mother Carey's Chickens is not noticeable among the white-caps when the birds flit aimlessly hither and thither, but when they fly steadily in one direction, their unchanging position makes them conspicuous from the rear. At times one sees streams of Mother Carey's Chickens flying swiftly and steadily in one direction, quite unlike their usual custom. I fancy that if any delectable food becomes available, birds at a distance see others go to it and fly towards them, and we presently have streams of birds flying towards it from all the surrounding sea. When *Fregatta grallaria* gather to feed, the white rumps and lower surfaces of the high-held wings make a twinkling white effect conspicuous at considerable distance.

To turn to an entirely different group of birds, the writer has in the past few months had much experience with the Limicolæ. These are mostly flocking species, usually strong flyers, and preyed upon to an unusual degree by hawks, which attack them from above. In the main the species are concealingly colored. The Woodcock and Wilson's Snipe are particularly so. The Ring-neck and Piping Plovers match admirably the flats and dry sand they respectively frequent. The Semipalmated and Least Sandpipers

are very inconspicuous from above, even when moving actively about on mud flats. The color of a Yellow-leg I recently observed sitting quietly at the edge of a bit of marsh rendered it very inconspicuous, and I have seen a White-rump when startled, crouch down concealing the bulk of the dead white underparts and practically disappear against the brightly lighted mudflat on which it had been feeding. The Sanderling, which frequents the bright lights of the ocean line, is lighter colored than usual.

Yet most of the species when on the wing are conspicuous, and then, or particularly when starting to fly, show colors as clearly of recognition value as the diagnostic whistles of many species.

The writer finds the sharply contrasted black and white colors of the Sanderling's wing the best field mark to determine that species in any plumage. The White-rumped Sandpiper, a non-committal enough looking bird on the ground, is easily recognized by its white rump as it takes wing. Its tail is darker than usual in the group and emphasizes the white rump. The narrow white line in the wing of the Spotted Sandpiper has a different look from that of any other species, and the blackish under wing surfaces of the Solitary Sandpiper are at once an infallible and conspicuous criterion of that species. The black patch under the wing of the Black-breasted Plover, which distinguishes young and fall birds from the Golden Plover, is much more conspicuous than one would think. Only recently the writer was observing one on a distant tussock which he could not be sure was even a plover. As it took flight this mark could be seen and its *pe-a-we* note also proclaimed it.

There seems to be no good long-distance mark for telling Semipalmated from Least Sandpipers; with us they perhaps occur in mixed flocks, and need none. The white under-surfaces of a compact, swiftly moving flock of these birds showing conspicuously at intervals perhaps has some recognition and directive significance.

Few birds are as consistently concealingly colored as the Woodcock. Perhaps the whistling of its wings as it rises takes the place of recognition marks of other species.

At any rate advertisement is so common in animals that it is hard to believe it has no particular value to them. In the Canadian Rockies three species of mammals sometimes occur living in

close proximity, marmots, coneys, and a spermophile, striped something like a high-colored chipmunk. The marmots and coneys, harmonizing in color with the gray rock slides, are continually advertising their presence by persistent whistling and bleating. The conspicuously colored spermophile is silent.

In conclusion, the writer's observations foster the belief that advertising and concealing colors, each in its own way, are of value to a bird, and that the bird's plumage is determined as a compromise between the two adapted to its particular needs and habits. Probably there are other forces also acting more or less to determine the colors, as adaptation to light. Birds living in insufficient light have, as a rule, dark colors which absorb, those in superabundant light, lighter colors which repel it.

OBSERVATIONS ON THE YELLOW-BILLED TROPIC-
BIRD (*PHAETHON AMERICANUS* GRANT) AT THE
BERMUDA ISLANDS.BY ALFRED O. GROSS.¹*Plates III-XI.*

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THIS paper is based upon studies made while at the Bermuda Biological Station from June 17 to August 2, 1910, and from June 26 to August 5, 1911. It is a pleasure here to acknowledge my gratitude to Prof. E. L. Mark, director of the Bermuda Station, for many valuable suggestions and for revising the manuscript.

The geographical location of the Bermudas is unique, in that they are in mid-ocean about seven hundred miles from the nearest land. The longitude of the center of the group is 64° 39' 53" W.,

¹ Contributions from the Bermuda Biological Station for Research, No. 23.

about that of Halifax, and the latitude $32^{\circ} 15' 23''$ N., or about that of Charleston, S. C., and of Los Angeles, Cal. The islands are nearly equi-distant from Halifax, New York, Charleston and the nearest of the West India Islands. The extreme isolation of the Bermudas is a fact of the utmost importance in considering its animal life, and especially its bird life, for the islands lie outside the courses of the great migration routes of the main land. As a consequence relatively few birds regularly visit the islands during the spring and fall migrations.

The Bermudas embrace over 150 islands, but the majority of these are extremely small and not inhabited by man. They form a long, narrow, hook-shaped group, which if placed in a straight line would reach not more than 15 to 20 miles. The width of this hook varies from one half mile to two miles. The total area of dry land is between 19 and 20 square miles, but the coral reefs extend over a much greater area. From the top of Gibb's Hill lighthouse, one of the two lighthouses of the islands, the ocean can be seen on all sides.

The vegetation is semi-tropical, but there is a predominance of second-growth cedars, which give the islands an appearance not unlike that which one may see on our own New England coast (Plate III, fig. 1). The majority of the larger islands are covered with these cedars, among which are interspersed clusters of palmetto palms. In the parks and private estates there are cultivated many trees, such as the royal, sago, cocoanut and grugu palms, the royal poinciana, the rubber tree, the pawpaw, etc. These give a decidedly tropical effect to certain sections of the islands. Since only a small part of the land is under cultivation, there are many neglected areas where the vegetation takes its own course, thus forming ideal resorts and nesting sites for many of the land birds. Along the low-lying shores of some of the inlets and bays are narrow but impenetrable thickets of mangroves, which are also a rendezvous for many birds, especially during the hot hours of the day. Mention should also be made of the luxuriant oleanders, which are in the prime of their beauty and fragrance during June and July. There are few features of the vegetation which contribute more to make these beautiful islands charming and attractive.

The greater part of the dry land of the islands consists of a limestone made up of the wind-blown fragments of shells and corals firmly cemented together. This rock is easily eroded, but when a fresh surface is exposed to the action of the weather for some time, it becomes hard and resistant. The shores of many of the islands are precipitous or overhanging cliffs, which have been honey-combed by the incessant action of the surf or the solvent effect of rains. It is among the recesses and caves of these cliffs that the Tropic-birds of Bermuda nest and rear their young.

The Yellow-billed Tropic-bird, *Phaethon americanus*, locally known as the Boatswain Bird, or the Long-tail, is the only one of the two species of Tropic-birds of the West Indies which visit the Bermudas. These birds are tern-like in appearance and manner of flight, although belonging to the order Steganopodes. The gular pouch, which is characteristic of the Steganopodes, is entirely feathered and much reduced in size in the Tropic-bird, but it nevertheless functions as a pouch in the process of feeding.

The plumage of the adult Tropic-bird is a satiny white with the following prominent black areas: a spot in front of, and slightly below, the eye, which is continued backward as a narrow band through the ocular region; a large oblique band on the lesser wing coverts and extending thence on to the scapulars and inner secondaries; patches on the outer shafts of 5 or 6 of the primaries; and stripes on the flanks. The black markings on the primaries and secondaries are very conspicuous when the bird is seen in flight. The iris is dark brown, the tarsus bluish, and the toes and webs jet black. The bill varies from pale yellow to bright orange-red, depending on the age of the bird. The tail is extended into two very long central feathers, which are of variable length and color. In adult birds these feathers have a marked tinge of russet brown or dull salmon, but no individuals were seen in which there was a distinctly reddish color, such as is frequently described. In a very few there was a roseate tinge to the plumage, which was accentuated on the feathers of the neck and breast. There is no consistent variation in color or measurements which can be correlated with sex. The measurements of eight specimens are as follows:

	Sex	Length cm.	Tail cm.	Extent cm.	Wing cm.	Bill cm.	Foot cm.	Weight grams.
1.	♂	74.0	48.3	90.1	27.2	5.3	6.6	398
2.	♀	64.3	36.8	91.5	27.1	5.1	6.4	425
3.	♂	49.2	22.1	90.7	28.1	5.2	6.2	465
4.	♀	43.1	15.1	89.1	27.1	4.9	6.5	402
5.	♂	48.7	20.4	91.6	27.5	5.0	6.4	367
6.	♂	54.0	21.8	88.5	27.8	5.0	6.9	385
7.	♀	44.2	15.0	96.2	28.1	5.4	6.7	—
8.	?	62.5	32.4	91.5	27.4	5.5	6.8	—

The variation of the tail measurement is very great in the above series, since nearly all of the specimens are of nesting birds, in which the longer of the two long tail feathers are frequently frayed or broken or even absent.

The geographical range of the Yellow-billed Tropic-bird includes the islands of the West Indies; it extends as far west as Central America, and north to the Bermudas. The following records of its occurrence in the United States have also been reported: One on the coast of Nova Scotia, September 4, 1870;¹ one in the interior of Nova Scotia after a violent storm, in September, 1870;² an immature specimen captured in Orleans Co., N. Y., 1879;³ and one shot on the Banana River, Florida, April 21, 1886.⁴ A few others have been reported off the coast of Cape Hatteras⁵ and the coast of Florida.⁶ Their occurrence in the United States is rare, and none have been found to breed on our shores.

The Tropic-birds migrate from the West Indies and, except for occasional stragglers, none are to be found in the Bermudas during the winter months. This annual migration flight is remarkable when it is considered that the birds must necessarily fly over open water for a distance of more than 600 miles without any landmark to guide them. The first Tropic-birds appear at the Bermudas during the latter part of February, according to fishermen and local observers, but the great bulk of them do not arrive until the first weeks of March. Mr. Mowbray, Superintendent of the Bermuda Aquarium, while making a voyage to Turk's Island in

¹ Reid, Bulletin U. S. Nat. Museum, 1884, vol. 25, p. 264.

² Gilpin, Orn. and Oö., 1882, vol. 7, p. 123.

³ Coues, Bulletin, Nutt. Ornith. Club, 1880, vol. 5, p. 193.

⁴ Brewster, Auk, 1886, vol. 3, p. 481.

⁵ Gault, Wilson Bulletin, 1902, vol. 9, p. 141.

⁶ Lawrence, Pacific R. R. Reports, 1858.

1909, saw on February 9 and 10 several groups of 2 or 3 individuals each, which were flying in a direct course for the Bermudas. This agrees with the supposed course of migration of the Tropic-birds and illustrates the keen sense of direction and orientation which they must possess. These birds would probably be admirable subjects for experimenting on orientation.

When we arrived at the islands, June 17, 1910, and June 26, 1911, the birds were in the midst of their nesting activities. During the early morning hours many of them could be seen in the vicinity of their nesting sites gracefully circling and wheeling high above the surface of the water, with their long graceful tail feathers streaming out behind. As the birds flew back and forth over the sound, their pure white breasts and underparts reflected the bright emerald green of the water, in such a manner as to give their plumage a distinctly greenish appearance. The effect thus produced under certain conditions of light is very deceiving even to an experienced observer.

The food of the Tropic-bird consists chiefly of marine animals, which in the majority of cases are secured by diving. The birds go on long foraging flights, wandering, according to some observers, as far as 50 miles from land. On our return trip to New York in 1910 a lone individual was seen which was estimated to be 150 miles distant from Bermuda, and on June 25, 1911, I saw two of these birds which were 200 miles from land. These are probably extreme cases, but they serve to illustrate the unusually long excursions which the Tropic-birds may make in their search for prey.

The food contained in the gullets and stomachs of 5 adult specimens was made up, for the greater part, of squids and fishes, especially small minnows. In one of the stomachs there were a few fragments of a crab and a sea urchin, as well as particles of material which could not be identified. Two of the five kinds of fishes found belonged to species of flying fish (*Exocoetus furcatus* and *Exonastes exsiliens*) which are common in the waters of Bermuda. It would be interesting to know whether or not these flying fish are captured while they are sailing above the surface of the water. The food delivered to the young varies with the age of the nestling, therefore is best considered in connection with the account of the young birds.

The adult birds are most active during the early morning hours; it is only occasionally that they can be seen feeding during the middle of the day, the heat at that time being perhaps great enough to account for the diminution in their numbers. A few of my notes taken July 8-9, 1910, when two of us spent the night on Morgan's Island, may serve to show something of the usual activities and how they are related in time to the activities of other birds. Morgan's Island is one of the several islands at the entrance of Ely's Harbor. The limestone cliffs on the seaward side constitute one of the most extensive and accessible rookeries of the Tropic-bird to be found in Bermuda, hence an ideal place for studying the habits of both old and young birds. My notes are as follows:

- "July 9, 3:30 A. M. The first bird note heard is the clear ringing whistle of the Cardinal, which is roosting among the palmettos.
- "4:00 A. M. The Catbirds are beginning to tune up.
- "4:20 A. M. The White-eyed Vireos are joining the Catbirds in the oleanders.
- "4:30 A. M. Dawn approaching rapidly; the distant upper clouds are reflecting the light of the morning sun.
- "4:50 A. M. In the cedars, European Goldfinches are beginning to sing, but their notes can scarcely be distinguished in the exuberant chorus of other songsters.
- "5:00 A. M. Sunlight to be seen on the trees of the hilltops.
- "5:05 A. M. First Tropic-bird leaves the cliff.
- "5:10 A. M. At some distance from our hiding place two more Tropic-birds appear.
- "5:20 A. M. Tropic-birds are leaving the nests situated close about us. Some of them apparently have discovered our presence and are showing signs of uneasiness.
- "5:45 A. M. At some distance out at sea an adult bird makes a perpendicular dive into the water from a height of about 50 feet.
- "6:00 A. M. Many Tropic-birds are flying about on the sea side of the island. Birds are constantly leaving or returning to their nests.
- "6:25 A. M. Songs of the land birds diminishing in volume.
- "6:30 A. M. About 50 Tropic-birds can be seen at one time in the immediate vicinity of the cliffs and many others are either going out or returning from the sea."

The numbers remained practically constant until about 8:30 A. M., when there was a uniform, but rapid decrease, and by 11:00 A. M. there was only an occasional Tropic-bird to be seen flying about. The birds were again active during the few hours before sunset, but the numbers at this time never equalled those of the morning hours.

The diving of the Tropic-bird is remarkable in that the plunge is usually made from a height of 50 feet or more above the surface of the water. The bird after sighting its prey poises a second or two in mid-air by rapidly vibrating the wings, meanwhile maintaining a gaze on its victim. It then turns quickly at right angles and with wings folded darts through the air with the swiftness and precision of an arrow. Frequently this downward plunge takes the form of a spiral descent. It is uncertain whether this spiral course is the result of a voluntary act or not.

Nests of the Tropic-bird were found in favorable places among the cliffs at Ely's Harbor, Hungry Bay, Tucker's Town, Harrington Sound, Castle Harbor, Spanish Point and on nine of the islands of Great Sound. Verrill¹ estimated that 2000 pairs were breeding in the islands in 1901. Apparently the numbers have not changed very much since that time. The majority of the nests found during the latter part of June contained either eggs or else young in well advanced stages of development. This fact, correlated with the time of arrival of the birds and the period of nesting, indicates that there are probably two nesting periods in a season. Buckenham² states that several broods are reared during the year. There are doubtless two, but certainly not more than two, broods in a season reared by these birds while in the Bermudas.

Particular localities, especially on the south shore of the main island, seemed to be preferred by many of the birds. At Ely's Harbor and Tucker's Town it was not unusual to find as many as 50-75 pairs nesting within a range of less than 100 yards. The Tropic-birds are not, however, strictly gregarious, for isolated nests about the islands of the sound were very common. The so-called colonies probably exist because of the many choice nesting

¹ The Bermuda Islands, 1901-03, p. 680.

² Museum, 1894, pp. 15-16.

sites which chance to be situated in the particular locality, rather than to any gregarious or social instinct on the part of the birds.

The nature of the nesting site varies from that of the open places on the shelf-like ledges to that of the inner end of a narrow and circuitous passage, or the recesses of an obscure cave. In the two latter situations the presence of the adult bird may often be ascertained by inserting a long pole into the opening, which usually brings forth a shrill cry in response to the intrusion. At Tucker's Town nests were found in shallow excavations in the side of a high sand dune which ran along the shore. These cavities, which apparently were made by the birds themselves, were in each case at the base of some herbage, which to a certain degree shielded and protected the bird from the intense heat and light of the sun.

The height of the nest above the water varies greatly; it ranges from a point just above the high water mark to one situated near the top of the highest cliffs, perhaps 75 or 100 feet above the sea. At Ely's Harbor some of the nests were so low that during an unusually high tide accompanying a storm, they were overwashed by the waves and filled with heaps of sargassum and other sea weeds. The sargassum is found in many of the lower open nests, where it is deposited by the giant waves during the severe tempests of the winter months. No nesting material is ever collected by the birds, but the single egg is deposited on the bare rocks or else on the mat of sea weeds already present.

The nests most favorable for study and photography are those which are exposed to view and are open to the light, but unfortunately these are the ones most liable to destruction by the elements or by natural enemies. As a consequence nests in shallow but well protected cavities, from which the eggs and the young could be easily removed from time to time, were more desirable, being less liable to molestation. Nine such nests located on four of the islands of the sound near to the laboratory on Agar's Island were chosen for daily observations on the growth and development of the young. On Agar's Island a large observation box was constructed within four feet of a nest, from which more minute observations of the feeding habits could be made.

The eggs are extremely variable in their coloration and markings. In general they have a chalky white or creamy groundwork thickly

spotted with three colors: chestnut, chocolate brown, and purplish red. The spotting is usually more dense at the larger end and quite often presents a blotched or smeared appearance (Plate VI, fig. 8). On other specimens the distribution of markings is more uniform, there being no predominance of color at the larger end (Plate VI, fig. 7).

The chocolate color is easily rubbed off, especially when the egg is first immersed in water. Even the contact of the bird's body during incubation may remove more or less of the color.

The measurements of 8 eggs collected from various parts of the islands are as follows,—

	Longest diameter cm.	Shortest diameter cm.	Weight grams
1.	4.9	3.6	37
2.	5.1	3.6	35.2
3.	5.2	3.8	39
4.	5.2	3.6	38
5.	5.4	3.9	44
6.	5.6	4.1	40.9
7.	5.7	3.8	44
8.	5.8	3.7	45

The incubated egg weighs slightly less than the fresh egg.

The birds copulate in the recesses of the cliffs and apparently in the niche eventually to be used as a nesting site. At Bethel's Island I found two pairs copulating in different places in the rocks. In one case the female was bleeding about the head from wounds made by the male in his desperate attempts at holding the bird during copulation. Both females presented a somewhat mussed and haggard appearance. During the four days elapsing before the next visit to the island, eggs were deposited in these nests, and in all probability by the females previously observed. Several other pairs of adult birds were found together, but in these cases there was no evidence of copulation and no clue for the identification of sex.

Both the male and female birds take part in incubation, and during this period the egg is seldom left uncovered for more than a few minutes. The birds take their turns at the nest, thus giving each other an opportunity to feed. In one case an adult was seen feeding its mate while the latter was brooding the egg.

The period of incubation was not accurately ascertained, since the exact dates of the laying of the eggs under observation was not determined. One egg, which seemed fresh when found, required 28 days of incubation for the young to emerge. Other eggs under daily observation required from 15-25 days, but evidently these had been incubated some days when first observed.

The shell membranes of the eggs are resistant and leathery, a condition well adapted to withstand the sharp points of the stones and the hard barren surfaces on which the single egg is usually deposited. The young require considerable time to rupture this membrane even after the egg is pipped and fragments of the calcareous shell are broken away (Plate VI, fig. 9). In one, perhaps unusual, case the egg was pipped and the "peep" of the contained embryo was heard 42 hours before it had completely emerged.

The adult birds became accustomed to my frequent visits to their nests and allowed me to stroke them or to remove the egg without any sign of resistance. At the hatching of the egg, however, there was a profound change in the behavior of the parent birds.

The presence of the little one seemed to incite in them a ferocious antagonism against any intruder, and it was only with the greatest care and precaution that the little one could be safely removed for study. After some time had elapsed the parent birds seemed to adjust themselves to the new conditions and were approached with less or no opposition.

Nesting birds, although not accustomed to regular visits by any one, would allow an observer to operate a camera within a few feet of them, if care were taken to make no quick or unexpected movements. If the intruder approached nearer, the bird bristled up its feathers, spread its wings, and responded with a quick thrust of its sharp beak. After repeated annoyance the parent bird will leave the nest, an act, however, which it seems very averse to doing. This reluctance may be due to its helplessness while on its feet. The birds never walk upright, but the body is shoved along in a cumbersome manner by their diminutive legs. The wings are often brought into service for supporting and balancing the comparatively heavy body, which is scarcely raised above the surface on which the bird is moving (Plate IV, fig. 3). On first leaving the nest the adult bird leaps from the ledge and nimbly catches

itself on the wing, but sometimes, especially after being irritated or excited, it may fall to the water before taking flight. When once poised in the air, the Tropic-birds may be classed with the most graceful of sea birds. They have a very characteristic movement when flying, which is very unlike any other bird I know. Although these birds allow one to approach while on their nests, they are very cautious in returning to the nest if there is any suspicion of the presence of a human being in the immediate vicinity.

Among the enemies of the Tropic-birds are the colored natives, who molest the nests of the birds in spite of the stringent bird laws of the islands. It is probable the eggs collected are used as food. The robbing of nests for such purposes is said to be common in the West Indies. The wood rat (*Mus alexandrinus*), however, is responsible for some of the mysterious disappearances of the many eggs I had under observation. On one of my daily rounds to the nests on Two-Rock Island I caught one of these rats in the act of sucking an egg. The greedy creature was allowed to finish his meal, after which he was killed and preserved as evidence against his kind. I saw no other rats in the act of molesting eggs, but no doubt they find the Tropic-bird eggs a convenient source of food.

All of the Tropic-birds examined were infested with at least a few and sometimes with thousands of mites, of which there were three species at least. These mites never appear to be fatal to the bird, but nevertheless they must cause a disagreeable irritation when numerous. They feed upon the barbules of the feathers and in some instances this injury to the feathers may be so extensive as to cause a noticeably rough appearance of the plumage. Three species — identified by H. E. Ewing of Cornell University — were found in great abundance on some of the skins. *Docophorus breviantennatus* Piaget, belonging to the Mallophaga, is a large black form, which is very conspicuous when seen on a background of pure white feathers. The two species of true mites are *Alloptes microphaethon* Frb., and *Alloptes longipes*. n. sp., belonging to the family of Analgesidæ. The new species, *Alloptes longipes*, is described by Dr. Ewing in *Psyche*, Vol. 18, No. 1, p. 41.

III. LIFE HISTORY.

In the study of the life history of the Tropic-bird I was somewhat handicapped, since the life of the young spent in the nest extends over a period longer than the time at my disposal during either summer in Bermuda.

However, there was an abundance of material near the Biological Station, which enabled me to secure measurements, descriptions and photographs of every phase of their development. Daily observations and measurements were made of five birds of various ages, two of which are at either end of a complete series. By a careful comparison of the measurements (see Table, pp. 61-62) and descriptions of these two birds, it was possible to match them at the 33rd day of development. In making these comparisons the measurements of the tail, wing, bill, and foot were given greater weight, since these measurements seem to be more constant for different individuals of the same age. Furthermore, it is extremely difficult to measure accurately the extent and length of an active living bird, which never fails to offer great resistance to such a procedure. If the comparisons are correct, the length of time spent by the young Tropic-bird in the nest extends over a period of 62 days, or about two months. The time required for incubation, previously noted, is about 4 weeks, making the complete period about 3 months. The adult birds remain in the islands about 7 months, which affords them ample time to rear two broods, but not more, during any one summer in Bermuda. The following records of three of our land birds are interesting in comparison with those of the Tropic-bird.

	Time required for incubation.	Time spent by the young in the nest.	Total.
Finch ¹	9 days	10 days	19 days
Flicker ²	12 days	25-28 days	37-40 days
Golden Eagle ¹	30 days	90 days	120 days

The measurement of extent in the freshly hatched bird is less than the length, but this relation is reversed at the end of the 6th day, and by the time the young bird is ready to leave the nest the extent becomes three times the length minus the tail or more than

¹ W. L. Finley, *American Birds*, pp. 245-246.

² A. R. Sherman, *Wilson Bull.*, 1910, pp. 135-171.

twice the total length. Furthermore, the wings undergo their greatest development during the last few weeks spent in the nest, while the feet grow but little after the first month. This seems a most favorable condition in view of the fact that the feet are functional and necessary from the very beginning of the free life, while an extensive development of the wings in the early part of the life history would prove a great inconvenience.

TABLE OF MEASUREMENTS.

Age, days.	Length, cm.	Tail, cm.	Extent, cm.	Wing, cm.	Bill, cm.	Foot, cm.	Weight, grams
1	11.9		11.2	1.6	1.2	2.8	25
2	12.4		11.3	1.7	1.2	2.8	28
4	12.7		11.9	1.8	1.3	2.8	35
5	13.2		12.6	2.0	1.3	3.0	49
6	14.0		14.2	2.3	1.3	3.3	54
7	14.6		15.3	2.4	1.4	3.4	66
8	16.1		16.7	2.5	1.4	3.6	92
10	16.9		18.5	2.8	1.5	3.8	86
11	16.9		19.6	2.8	1.6	3.9	72
12	17.8		20.1	3.0	1.7	4.1	146
13	18.7		22.1	3.1	1.9	4.2	128
14	19.2		24.3	3.2	1.9	4.5	157
15	20.1		25.4	3.5	2.0	4.7	145
16	21.0		26.2	3.7	2.1	4.8	127
17	21.0		26.7	3.9	2.2	4.8	121
18	21.8		28.6	4.6	2.3	5.2	173
20	22.9		32.5	5.5	2.4	5.4	232
21	23.0		33.9	5.8	2.6	5.5	267
22	24.1	.4	36.1	6.2	2.7	5.6	253
24	24.3	1.0	37.6	6.9	2.9	5.6	250
25	25.9	1.5	40.7	7.2	3.0	5.7	303
27	26.9	1.9	43.0	8.0	3.1	5.8	302
28	27.4	2.4	45.1	8.7	3.2	5.9	321
29	27.6	2.6	46.6	9.4	3.3	6.0	349
30	27.9	3.1	48.6	10.1	3.4	6.1	325
31	28.7	3.2	49.8	10.4	3.5	6.1	359
32	29.1	3.5	51.6	10.8	3.6	6.1	353
33	29.9	3.7	52.9	11.2	3.6	6.1	348

TABLE OF MEASUREMENTS (Continued).

Age, days.	Length, cm.	Tail, cm.	Extent, cm.	Wing, cm.	Bill, cm.	Foot, cm.	Weight, grams.
34 ?	29.8	3.8	57.8	11.5	3.7	6.0	357
36 ?	31.1	4.1	59.1	12.6	3.8	6.1	355
37 ?	31.5	4.5	60.2	13.1	3.8	6.2	377
38 ?	32.3	4.9	62.8	14.2	3.9	6.2	390
39 ?	33.0	5.6	64.7	15.7	4.0	6.3	422
41 ?	34.5	7.1	70.4	17.5	4.2	6.3	570
48 ?	39.4	10.1	80.7	21.6	4.3	6.4	510
52 ?	40.6	11.2	82.4	22.2	4.4	6.5	497
57 ?	41.4	13.1	83.2	24.2	4.6	6.5	499
60 ?	42.6	13.7	86.1	24.6	4.6	6.6	467
62 ?	Left the Nest.						
Average growth per day.	.520	.380	1.269	.390	.058	.064	7.58
Percent of total growth accomplished, on the average, each day.	1.69	2.86	1.69	1.70	1.71	1.68	1.71

The above table of measurements is made from the studies of two birds which stand one at either end of the series. The two life histories seem to overlap but match comparatively well at the 33rd day of development. The age of the older bird is only approximately known (within 4 or 5 days), since the measurements of different young of the same age may vary as much as the growth of four or five days.

The weights of the young birds fluctuated a great deal from day to day; this was due to the fact that they were weighed in the morning after feeding time. A series of weighings made during the night, or very early morning before any food has been received by the young birds, would undoubtedly be less variable.

One of the young at the time of hatching when thoroughly dry and before it was fed weighed 25 grams, or 19 grams less than the egg from which it hatched. Another young bird weighed on the day of hatching 30 grams; but this individual was not watched and therefore it may have received food.

The food of the young during the first 10 or 15 days consists of snails and soft marine animals. In some cases it seemed to be

merely the regurgitated juices and semidigested food from the gullet of the parent bird. When the birds are between 15 and 30 days old, more than 90 % of the food consisted of squids, the remainder being made up of small minnows and some unidentifiable material. During the latter half of the young bird's life fish constitutes a large part of the food, although many squids, some of considerable size, were present in nearly every specimen examined.

It was not necessary, in most cases, to kill the bird in order to make an examination of the food, for the young birds, especially those of an age in which the instinct of fear was acquired, violently regurgitated their food on the slightest provocation, even the mere handling of the birds unaccustomed to my visits would cause them to throw up the entire contents of their gullets. By taking advantage of this simple means, it was easy to gain information about the food without causing the birds any serious injury. Below are lists of the animals, with their weights, which were found in five such regurgitations of different birds ranging from 30 to 50 days old, arranged in the order of the ages of the birds, No. 1 being the youngest.

No. 1.		No. 4.	
Squid	17 grams.	Squid	27.3 grams.
"	11.1 "	"	16.8 "
Minnow	2.4 "	"	14.5 "
	—	"	6.5 "
	30.5 grams.	"	5.7 "
		Flying Fish	4.5 "
		(part)	
		Fragments	3.2 "
			—
			78.5 grams.
No. 2.		No. 5.	
Squid	16.9 grams.	Squid	22.5 grams.
"	16.7 "	"	9.5 "
"	3.1 "	Flying Fish	10.0 "
	—	"	9.0 "
	36.7 grams.	"	7.5 "
		4 minnows and	
		fragments	26.5 "
			—
			85.0 grams.
No. 3.			
Squid	13.1 grams.		
"	10.1 "		
"	9.0 "		
"	2.5 "		
"	3.0 "		
Minnow	2.1 "		
	—		
	39.8 grams.		

The amount of food regurgitated by No. 4 and No. 5 may seem excessive, since it equals about $\frac{1}{2}$ to $\frac{3}{4}$ of the total weight of the bird, yet such quantities of food in one gullet were not unusual. Since the birds ordinarily are fed only during the early morning hours, one should expect to find large quantities of food delivered at this single meal. The squids, which, as we have said, make up the largest part of the food of the young, as they also do that of the adult birds, are probably captured out at sea, for I saw very few squids when making collections of marine animals about the islands. Thousands of squids are eaten each day by these birds, so there must be an enormous quantity of them in the vicinity of their feeding grounds.

The young birds become very fat and heavy during the last 10 or 15 days of their life in the nest, and in all cases under observation they weighed more at this stage than the heaviest of the adult birds. This storing up of substance which may later serve as food prepares them to withstand the strenuous ordeal required of them upon leaving the nest.

At the time of hatching, the young Tropic-bird is to all appearances a ball of fluffy down with its dark colored beak and black feet standing out in marked contrast to the background of white (Plate VII, fig. 11). It is only the region about the beak, the underparts, and the middle of the back which are pure white, for the remainder of the plumage, especially the crown, sides of the back, and region of the wings has a decided tinge of dull gray.

The eyes of the nestling remain closed for one or two days, but the young birds are very active and responsive from the very beginning. A mere touch, or even the click of the camera, is enough to incite the creature to extend its neck and open its beak in eager anticipation of some lucious snail or other appetizing morsel of food. In taking pictures of some of these birds, it was necessary to click the shutter several times before attempting the final exposure, in order to avoid the gaping attitude.

At the end of the fourth day (Plate VII, fig. 12) the birds have their eyes fully opened, but they blink incessantly when brought out to the open light.

During the first ten days of life in the nest the chief changes which occur are concerned with size, for no feathers appear during

this stage of the nestling. The beak becomes lighter in color, but the skin in front of the eyes (lores) and at the base of the upper mandible (front) remains jet black. The tarsus is bluish, but the toes and webs are black, as in adult birds. The down on the breast is much shorter and denser than elsewhere, thus forming a firm mat, which protects the tender body from the sharp stones or rough surface of the rock on which the bird is usually obliged to rest. A characteristic pose of the bird at this age is one with its body and head outstretched on the bottom of the nest (Plate VIII, fig. 14). This position was frequently assumed whether the bird was awake or asleep. The young showed no evidence of fear during the first two weeks, for when I approached the nest, they did not seem to be afraid of me. Often when I placed my hand near them they would pick at my fingers as if testing some new and strange kind of food. The young birds which I visited daily never developed an instinct of fear; but, on the contrary, as they grew older they seemed to be pleased to have me make a call during the long hours when they were left alone.

The adult birds remain very closely with the young during the first ten days. The little fellow is usually tucked in under the feathers of the adult and frequently sleeps with its head projecting through the feathers, just as a little chicken does when it is brooded by the old hen. When the little creature became restless the old bird uttered a series of low guttural sounds, which, I assume, were intended as disapproval.

At the end of the 16th day were seen the first feathers. They made their appearance on the scapular region of the spinal tract (Plate VIII, fig. 14). By separating the down, the tips of the bluish colored sheaths of the feathers may be seen projecting through the dark skin. The feathers grow rapidly, soon lose their sheaths, and by the 20th day are well expanded, producing a conspicuous patch of black-and-white barred feathers (Plate IX, fig. 15). By this time the sheaths of the feathers of the breast, the primaries, secondaries, and tail feathers appear, but they do not show through the coat of down until several days later. During the first twenty days the bill assumes more and more the shape and proportions of that of the adult. Its dark bluish color changes to a white or flesh color, but the tip of the mandibles retains a

brownish tinge. The skin about the base of the upper mandible and the lores remains jet black and is devoid of down or feathers at this age.

From the 20th to the 35th day marked changes in the plumage occur. At the end of the 25th day the developing wing feathers are so heavily charged with blood that the nestling is unable to support its wings continuously (Plate IX, fig. 16).

By the end of the 35th day the wing feathers, including the coverts, are well expanded and now form with the scapulars, which were the first feathers to appear, a continuous band. The down gradually frays away as the feathers replace this first protective covering.

The tail feathers are well advanced during this period, and by the 35th day the two central tail feathers, destined to become the long feathers in the tail of the adult, attain a length of 4 cm. The feathers of the head and rump, although sprouted, do not show through the coat of down; so, when the bird is viewed from the side it displays alternate areas of down and feathers (Plate X, fig. 17). The feathers of the breast become well expanded at the 37th day and with the down form a veritable feather mattress, on which the bird rests or crawls about the nest (Plate X, fig. 18). The feathers about the base of the beak have appeared and now completely conceal the dark skin. The black loreal spot, so conspicuous in the adult, is now well differentiated.

The adult bird spends less time with the young as the latter becomes older, at least this is true of the birds which were under continual observation. After the 20th or 25th day the young bird on Agar's island was visited by the parent bird only during the morning at feeding time. The adult bird usually appeared about 6 o'clock and after 2 or 3 visits was seen no more until the next day. After being fed the young bird settled down for a profound sleep, but at irregular intervals, from some unknown impulse, it would suddenly arise, stretch its wings, preen its feathers, and then settle down again for another nap. In the afternoon the young bird was usually awake and would amuse itself by picking at the stones about the nest, or perhaps would snatch at the flies or gnats which were often abundant in the vicinity of the nest. At other times it would spend much time oiling and preening its

feathers by running its beak through its plumage. When I chanced to make a noise in the observation box, the bird would suddenly squat down and with an excited look peer out towards the opening of the nest to see what was going on.

At night the young bird slept most of the time, but when day-break came, it was all alert and very attentive to every noise which in any way suggested the coming of the parent with the customary breakfast. The adult bird when it appeared uttered a peculiar and characteristic "click" as it flew back and forth above the nest before alighting. This call note never failed to excite the little creature to the utmost. As the adult alighted at the edge of the nest the young bird produced a series of guttural chirps, and braced itself back on its legs and tail in preparation for receiving the long expected breakfast.

The food is transferred from the pouch-like gullet of the adult to that of the young by a process of regurgitation. This transfer of food is accompanied by a series of gulps, strains, and wriggles of the head and neck on the part of both birds.

By the 40th day the young is completely feathered, but down still shows about the region of the head and rump. The tail feathers are now prominent and each shows a black spot near the end of the vein. Ten days later the down is frayed away and the plumage assumes the typical markings of the immature phase of plumage. The black markings are most evident on the wing coverts, scapulars, and inner secondaries, the regions which are destined to become black in the adult. The bill now has a distinctly yellowish color, which continues to deepen to reddish-orange in the older adult birds. From the 50th day (Plate XI, fig. 19) to the 60th day (Plate XI, fig. 20) the black areas of the coverts and secondaries become more continuous, while the black barring of the crown and back become diminished, or rather obscured, by the white tips of the growing feathers. The relative proportions between the wings and the tail have undergone a great change and now approach those of the adult.

The young birds are unable to fly well when they leave the nest, although the wings have been exercised very frequently for some weeks. Those which I observed leaped into the water from the edge of the nest and then made their way out to sea by paddling.

The young birds flopped their wings vigorously, as if attempting to fly, but were never able to rise from the water during the time I observed them. Such an event created considerable excitement among the adult Tropic-birds, which assembled to witness the affair. The young bird while thus floating on the water may be fed by the adults, but more probably depends on its stored fat until it gains enough strength to fly and fish for itself.

IV. EXPLANATION OF PLATES.

PLATE III.

Fig. 1. One-Rock Island, a typical island of Great Sound nearly covered with second growth cedars, a few palmettos, and cactuses. Five of the cavities on this side of the island were occupied by nesting birds.

Fig. 2. A close view of one of the cliffs on the outer shore of Morgan's Island, Ely's Harbor. The lower nest is 6 feet above high water mark.

PLATE IV.

Fig. 3. Adult Tropic-bird in the act of leaving her nest at One-Rock Island. This view shows how the wings may be used in locomotion on land, especially on rough uneven surfaces.

Fig. 4. Adult Tropic-bird on her nest at Tucker's Town. The nest was excavated, probably by the birds themselves, in the side of one of the high sand dunes which run along the shore. The long tail feather is bent over the back of the bird.

PLATE V.

Fig. 5. Adult Tropic-bird resting in a natural cavity of the cliffs at Bethel's Island.

Fig. 6. Adult Tropic-bird on her nest and egg at Morgan's Island. This nest is made in a thick mat of sargassum which was deposited by the waves.

PLATE VI.

Fig. 7. Nest and egg of the Tropic-bird at Tucker's Town. Same nest as shown in Plate IV, fig. 4. The egg gave the following measurements: longest diameter 4.9 cm., shortest diameter 3.6 cm., weight 37 grams. The markings on this egg are distributed with comparative uniformity.

Fig. 8. Egg of the Tropic-bird at Two-Rock Island. The measurements

are: longest diameter 5.6 cm., shortest diameter 4.1 cm., weight 40.9 grams.

Fig. 9. Egg pipped and some of the calcareous shell broken away. The shell membrane, however, is intact except where it is pierced by the beak of the embryo. The measurements are: longest diameter 5.4 cm., shortest diameter 3.9 cm., weight before being pipped 44 grams.

Fig. 10. Same egg as shown in fig. 9, but after the shell membrane had been ruptured. In photographing, the head was slightly pulled out to bring the beak into view. The dark patch of down on the crown is noteworthy.

PLATE VII.

Fig. 11. Young Tropic-bird. Age 12 hours; length 11.9 cm.; extent 11.2 cm.; wing 1.6 cm.; foot 2.8 cm.; bill 1.2 cm.; weight 25 grams before receiving any food. Down white, excepting that the crown, regions of wings, rump, and a patch on the back of the neck are tinged with dusky or dull gray. The black skin is naked at the base of the beak, on the lores, on the feet, and on the legs as far up as the heel. The beak and tarsus are a light bluish slate color, the toes and webs of a very much darker slate color. The eyes remain closed for a period of two days.

Fig. 12. Young Tropic-bird. Age 4 days; length 12.7 cm.; extent 11.9 cm.; wing 1.8 cm.; bill 1.3 cm.; foot 2.8 cm.; weight 35 grams. The bird at this age has its eyes open and is very alert and active. The down of the breast is much shorter and thicker than that of other parts of the body. The beak remains a bluish slate color like that of the freshly hatched bird. The oil-gland tubercle is present, but is not yet functional.

PLATE VIII.

Fig. 13. Young Tropic-bird with natural rock background. Age 8 days; length 16.1 cm.; extent 16.7 cm.; wing 2.5 cm.; foot 3.6 cm.; bill 1.4 cm.; weight 92 grams. No feathers have as yet appeared. The legs in their relation to the body have a noticeably posterior position.

Fig. 14. Young Tropic-bird. Age 15 days; length 20.1 cm.; extent 25.4 cm.; wing 3.5 cm.; foot 4.7 cm.; bill 2.0 cm.; weight 145 grams. The various darker regions of the down mentioned in the description of the freshly hatched young are still present, but do not seem to be so sharply differentiated. There is very little down on the sides of the body beneath the wings. In the scapular region have appeared the sheaths of the first quill feathers. These sheaths with their downy tips measure 1 cm. in length. The oil-gland tubercle is now well developed and has two openings, through which the oil exudes when the gland is squeezed. There is no down immediately around the tubercle, but a circlet of hair-like feathers is appearing around its base.

PLATE IX.

Fig. 15. Young Tropic-bird. Age 20 days; length 22.9 cm.; extent 32.5 cm.; wing 5.5 cm.; bill 2.4 cm.; foot 5.4 cm.; weight 232 grams. This view was taken from a position above the bird in order to show the expanded, barred tips of the first feathers in the scapular region. The sheaths of the feathers of the wings, tail, interscapular region, and breast are appearing through the skin. The skin about the base of the mandibles and lores is dotted with the papillæ of developing feathers.

Fig. 16. Young Tropic-bird. Age 24 days; length 24.3 cm.; tail 1.0 cm.; extent 37.6 cm.; wing 6.9 cm.; bill 2.9 cm.; foot 5.6 cm.; weight 250 grams. The quill feathers have pierced or are piercing nearly every part of the body where such feathers occur. The quills of the primaries and secondaries are so heavily charged with blood that the bird is unable to support its wings continuously, but allows them to rest on the floor of the nest. The tips of the secondaries are expanded and these feathers now range from 2 cm. to 3 cm. in length. The primaries are not as far advanced as the secondaries. The tail feathers are much slower in their growth than the wing feathers, but at this stage the entire 12 are present. The two feathers destined to become the long tail feathers of the adult are already much longer than the others. These central feathers are 1 cm. in length, but with the tufted downy tips they measure 2.2 cm. The feathers of the breast have expanded tips, but they do not as yet show through the thick mass of down.

PLATE X.

Fig. 17. Young Tropic-bird. Age about 34 days; length 29.8 cm.; tail 3.8 cm.; extent 57.8 cm.; wing 11.5 cm.; bill 3.7 cm.; foot 6.0 cm.; weight 357 grams. The bird at this age, with its alternate areas of down and feathers, and its queer actions, presents a very ungainly and awkward appearance. The feathers in the region of the wings have undergone marked development and now appear as a continuous area of barred plumage. The primaries are white excepting the outer five, which have a black spot or patch in the vein near the tips of the feathers. The secondaries are white excepting the innermost 3 or 4, which are barred with black. The wing coverts are also barred with black. The feathers of the middle of the back are appearing, but are hidden from view by the feathers of the scapular region. The tips of the secondaries and coverts extend back nearly to the region of the oil gland, which is well developed at this stage. The shafts of the tail feathers are black, and each feather shows a black spot near the tip of the vane. The pure white feathers of the breast are well expanded, and replace the mat of down, which has gradually frayed away giving place to this more substantial protective covering. The feathers of the flanks are striped and barred with black as in the adults.



1. ONE-ROCK ISLAND.



2. CLIFF, MORGAN'S ISLAND.

2000



3. ADULT TROPIC-BIRD LEAVING NEST.



4. ADULT TROPIC-BIRD ON NEST.

2000



5. ADULT TROPIC-BIRD RESTING IN A NATURAL CAVITY.



6. ADULT TROPIC-BIRD ON NEST.



7

7, 8. EGGS OF TROPIC-BIRD.



8



9. PIPPED EGG OF TROPIC-BIRD.



10. SAME EGG WITH SHELL MEMBRANE RUPTURED.

2000



11. YOUNG TROPIC-BIRD 12 HOURS OLD.



12. YOUNG TROPIC-BIRD 4 DAYS OLD.

THE
HISTORY
OF
THE
CITY
OF
NEW
YORK
FROM
1624
TO
1898



13. YOUNG TROPIC-BIRD, 8 DAYS OLD.



14. YOUNG TROPIC-BIRD, 15 DAYS OLD.

THE
MUSEUM
OF
THE
CITY OF
NEW YORK
AND
THE
MUSEUM OF
THE
CITY OF
BOSTON



15. YOUNG TROPIC-BIRD, 20 DAYS OLD.



16. YOUNG TROPIC-BIRD, 24 DAYS OLD.

THE
GOLDEN
RULE



17. YOUNG TROPIC-BIRD, ABOUT 34 DAYS OLD.



18. YOUNG TROPIC-BIRD, ABOUT 37 DAYS OLD.



19. IMMATURE TROPIC-BIRD, ABOUT 52 DAYS OLD.



20. IMMATURE TROPIC-BIRD, ABOUT 60 DAYS OLD.

SECRET

The feathers of the head are beginning to show through the skin. The white hair-like feathers of the auricular region now measure about 0.8 cm. in length, but are hidden from view by the mass of down on the sides of the head.

Fig. 18. Young Tropic-bird. Age about 37 days; length 31.5 cm.; tail 4.5 cm.; extent 60.2 cm.; wing 13.1 cm.; bill 3.8 cm.; foot 6.2 cm.; weight 377 grams. Except for a slight advance in development of plumage, the description of the bird shown in fig. 17 will also apply to this one. This figure, however, shows the plumage of the head and breast to much better advantage. Feathers now completely hide the black skin at the base of the upper mandible, and lores, which were devoid of feathers and down until the 20th day of development. The black loreal spot, which is present in the adult, is here distinctly differentiated from the white and its appearance forms an important epoch in the development of the plumage.

PLATE XI.

Fig. 19. Immature Tropic-bird. Age about 52 days; length 40.6 cm.; tail 11.2 cm.; extent 82.4 cm.; wing 22.2 cm.; bill 4.4 cm.; foot 6.5 cm.; weight 497 grams. The primary covering of down is completely replaced by the plumage of the advanced immature bird when the young attains the age of 50 days. This view was taken to show the black markings of the feathers of the flanks, back, and head. The bill now has a pale yellowish color.

Fig. 20. Immature Tropic-bird. Age about 60 days; length 42.6 cm.; tail 13.7 cm.; extent 86.1 cm.; wing 24.6 cm.; bill 4.6 cm.; foot 6.6 cm.; weight 467 grams. This figure shows the bird in the final and splendid development of body and plumage which it attains before leaving the nest. To acquire the plumage of the adult only slight modifications are necessary, viz.: the disappearance of the black bars of the crown and upper parts of the body and the condensation of the black areas in the region of the wing coverts and secondaries. Two days later, at 62 days of age, this bird left the nest.

2000



19. IMMATURE TROPIC-BIRD, ABOUT 52 DAYS OLD.



20. IMMATURE TROPIC-BIRD, ABOUT 60 DAYS OLD.

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A SHORT SUMMER OUTING IN NEWFOUNDLAND, 1911.

BY EDWARD ARNOLD.

IN 1894 the writer made a collecting trip through the Canadian Provinces of Manitoba, Saskatchewan, and Alberta, and enjoyed the novel experience so much that for nine years following he put in a good part of the months of May and June enjoying field work in Saskatchewan and Alberta, despite mosquitoes and other winged pests, which flourish so abundantly during the early summer in those localities; during those years taking many sets of Richardson's Pigeon Hawk (*Falco columbarius richardsoni*), Sprague's Pipit (*Anthus spraguei*), Nelson's Sparrow (*Passerherbulus nelsoni nelsoni*), Leconte's Sparrow (*Passerherbulus lecontei*), Baird's Sparrow (*Ammodramus bairdi*), Marbled Godwit (*Limosa fedoa*), Western Willet (*Catoptrophorus semipalmatus inornatus*), Upland Plover (*Bartramia longicauda*), Avocet (*Recurvirostra americana*), Piping Plover (*Ægialitis meloda*), Wilson's Phalarope (*Steganopus tricolor*), Black-necked Stilt (*Himantopus mexicanus*), Woodcock (*Philohela minor*), Killdeer (*Oryechus vociferus*), also about twenty different kinds of ducks, besides many other species too numerous to mention here.

The years 1905, 1906, 1907, found me during the months of June studying the nesting habits of Kirtland's Warbler (*Dendroica kirtlandi*) in Northern Michigan, my home State. In April, 1908, I moved to Montreal and the following year took such sets as Sharp-shinned Hawk (*Accipiter velox*), Broad-winged Hawk (*Buteo platypterus*), Savanna Sparrow (*Passerculus sandwichensis savanna*), Slate-colored Junco (*Junco hyemalis hyemalis*), and other birds of various kinds found nesting in the vicinity of Montreal and adjacent townships. In my collecting trips around Montreal I was frequently accompanied by my friend Mr. W. J. Brown, an enthusiastic field naturalist, who has accumulated a very fine collection of sets of eggs of the local birds found breeding in the Province of Quebec. Mr. Brown and myself often discussed Newfoundland as a desirable field to explore and our plans were finally made to put in the early part of the season of 1911 collect-

ing there, our special desiderata being sets of Fox Sparrows (*Passerella iliaca iliaca*), Greater Yellow-legged Plover (*Totanus melanoleucus*), Pigeon Hawk (*Falco columbarius columbarius*), Tennessee Warbler (*Vermivora peregrina*), and Ruby-crowned Kinglet (*Regulus calendula calendula*). We left Montreal via the Intercolonial Railway and after a pleasant ride through the Provinces of Old Quebec, New Brunswick, and Nova Scotia, arrived at North Sydney, Mr. Beers, of Bridgeport, Conn., accompanying us, having met us en route. There we boarded a steamer for Port aux Basques, Newfoundland, a distance of 110 miles. The trip was very rough and many of the passengers were sea sick. We arrived at Port aux Basques early the next morning — weather foggy and lots of ice and snow discernible on the bleak forbidding shores.

The summer there is short. On our journey over the Reid-Newfoundland Railway ice and snow could often be seen from the car window and during the first week of June the bushes and trees were just beginning to show the green of the opening leaves. Along the Humber River we picked fine bunches of trailing arbutus, which was just in its prime the first week in June. On the upper levels, during the early part of June, water froze every night, forming on edge of ponds a small coating of ice each morning. The snow was from three to six feet deep on the sides of the hills and we could walk on the top of it until 9 or 10 o'clock without sinking in over an inch or two. Notwithstanding this cold weather many birds had made their nests; some had laid their eggs, and others had young or were incubating their eggs,— such species as the Fox Sparrow (*Passerella iliaca iliaca*), Savanna Sparrow (*Passerculus sandwichensis saranna*), Least Sandpiper (*Pisobia minutilla*), Greater Yellow-legs (*Totanus melanoleucus*), Wilson's Snipe (*Gallinago delicata*), Welch's Ptarmigan (*Lagopus welchi*), were already incubating their eggs, and a Myrtle Warbler (*Dendroica coronata*) was building close to our camp. The Ruby-crowned Kinglets (*Regulus calendula calendula*) were in full song; the bird considering its size is a marvellous, rich singer, its note being a distinctive feature of every place we stopped to collect or make observations.

The Reid-Newfoundland is narrow gauge, but very comfortable, dining and sleeping cars are carried on all passenger trains; the

meals are very good and the service excellent. Mixed trains are also in service on alternate days. The road runs through a most picturesque territory. Generally speaking, the physical features of the island are of a rocky, mountainous, barren nature, comprising vast stretches of spruce woods and bogs, well watered in many places by streams, lakes or ponds, large and small. Fire has devastated many localities on both sides of the Humber River, leaving unsightly stretches of blackened skeletons of once handsome trees.

The fishing is excellent in all the streams and in many of the ponds and lakes, trout and salmon rising freely to the fly.

The Fox Sparrow (*Passercella iliaca iliaca*) is a common resident breeder, large, conspicuous and handsome, a vigorous sweet singer heard at all hours of the day and at times at sunset. Its clear, rich bell-like notes rise among the evergreen woods filling the air with delicious melody, beginning lustily and at length closing softly, frequently drowned by the music of the wind in the tree tops. This species is an early breeder. We found young in the nests and others flying around during the first week in June. We located a few nests with young in different stages of growth and also later nests containing in each instance but three eggs — which appears to be the normal complement in almost every instance. The nests are made of grass, moss, rootlets, twigs, etc., the lining fine hay, rootlets, caribou hair, etc., and are usually placed on the ground at the foot of a small spruce, sometimes from 2 to 5 feet up in the branches of spruce trees. The eggs are greenish, spotted and blotched with reddish brown of various shades, in some instances so heavy and numerous that the ground color is almost obscured. It is the characteristic sparrow of the island and in evidence at many points along the railway. We thoroughly enjoyed the beautiful bell-like notes of the Hermit Thrush and White-throated Sparrow, found quite common at many of our stopping places. Greater Yellow-legs (*Totanus melanoleucus*), Least Sandpiper (*Pisobia minutilla*), and Wilson's Snipe (*Gallinago delicata*), were the waders most in evidence, especially on the elevated plateaus in the vicinity of the small lakes and ponds. The Greater Yellow-legs (*Totanus melanoleucus*) is very noisy and frequently followed us persistently, yelping its alarm notes.

The notes of the Wilson's Snipe (*Gallinago delicata*) could be heard at all hours of the night and often during the day. We flushed a number of these birds and found several nests with eggs or young in the vicinity of the nest. Spotted Sandpipers (*Actitis macularius*) were frequently in evidence and breeding.

As a result of our trip we observed the following birds and obtained nests and eggs as given below:

1. **Gavia immer.** LOON.—One pair seen on a small pond on June 6. At this date the birds had not started to lay.
2. **Cephus grylle.** BLACK GUILLEMOT.—Fairly abundant. Breeding on the "banks" on June 10.
3. **Larus hyperboreus.** GLAUCOUS GULL.—Common. Several pairs had their nests built out on large boulders in the center of ponds, but as the water was very cold and over our heads in depth, we could not examine them.
4. **Larus marinus.** GREAT BLACK-BACKED GULL.—Generally distributed along the western coast and breeding. A few pairs were found nesting on small islands in ponds adjacent to the Bay of Islands on June 10.
5. **Larus argentatus.** HERRING GULL.—Common resident. Observed everywhere off the "Banks" of Newfoundland, but their numbers are being rapidly decimated by the fishermen.
6. **Sterna hirundo.** COMMON TERN.—We saw a small colony at Bay of Islands on June 7. At this date they apparently had not started to build.
7. **Oceanodroma leucorhoa.** LEACH'S PETREL.—Several burrows of this species were located on an island June 10, but as the holes invariably ran under a large rock, a pickaxe was necessary to examine the contents.
8. **Mergus americanus.** MERGANSER.—Nest found May 19 on the banks of the Humber River, containing nine fresh eggs.
9. **Clangula clangula americana.** GOLDEN-EYE.—Nest containing eight fresh eggs found in a dead tree near the Humber River on May 21.
10. **Somateria dresseri.** EIDER.—Saw two birds of this species at St. Georges Bay on June 9.
11. **Branta canadensis canadensis.** CANADA GOOSE.—Common breeder. At the time of our visit the young were already hatched and when they were approached the anxious parents were heard "honking" in the vicinity.
12. **Botaurus lentiginosus.** BITTERN.—One individual heard "pumping" on June 1 and was undoubtedly breeding.
13. **Gallinago delicata.** WILSON'S SNIPE.—A very abundant species and noted wherever there was bog. Birds were heard overhead continuously from 9.30 P. M. to 4.30 A. M., June 9. A nest containing three fresh eggs was found on a mound in a spruce bog on June 8. On June 12 another

was located where the young had just left, as evidenced by the egg shells lying about.

14. *Pisobia minutilla*. LEAST SANDPIPER.—Common. Several nests examined between June 3 and 16; one had three eggs and two others had four eggs each in various stages of incubation. The sets were simply laid in depressions in moss off the margins of "ponds."

15. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Saw a number on the elevated plains where the bird's harsh cries may be heard at times. A nest of this species was found on June 3 with four badly incubated eggs, which were simply laid on a hill adjoining a large tract of spruce bog. On June 13 two others were discovered in a similar location, four handsomely marked eggs being the complement in each case.

16. *Totanus flavipes*. YELLOW-LEGS.—Saw several individuals on the barrens, but no nest was found.

17. *Actitis macularius*. SPOTTED SANDPIPER.—Common along the shores of lakes and streams, and breeding abundantly.

18. *Lagopus welchi*. WELCH'S PTARMIGAN.—In a dry place in a large area of spruce bog, and at one of the highest points reached by the railway, we flushed a bird of this species off her nine fresh eggs on June 6. The nest was merely a depression in moss amongst spruce sprouts and thinly lined with feathers and grasses. Two other birds were seen on the barrens in the same neighborhood, but investigation failed to reveal any more nests.

19. *Astur atricapillus atricapillus*. GOSHAWK.—We saw a few in the mountain regions, but they are not very common.

20. *Falco columbarius columbarius*. PIGEON HAWK.—On June 6 a noisy pair were located in some heavy spruce timber at the base of a small precipice. After carefully looking for the nest in the trees, it was eventually found with four young on a ledge of rock on the mountain side.

21. *Pandion haliaëtus carolinensis*. OSPREY.—Not numerous. A few birds seen flying from the sea inland. A breeding resident.

22. *Ceryle alcyon*. BELTED KINGFISHER.—Fairly common along the Humber River, where a nest of seven fresh eggs was taken on July 1.

23. *Dryobates villosus terranovæ*. NEWFOUNDLAND WOODPECKER.—Common in the mountainous country and breeding in large dead birch trees which have been charred by forest fires.

24. *Dryobates pubescens medianus*. DOWNY WOODPECKER.—Probably common, but we only saw half a dozen.

25. *Picoides arcticus*. ARCTIC THREE-TOED WOODPECKER.—Saw three birds in the higher levels.

26. *Colaptes auratus luteus*. NORTHERN FLICKER.—Common. Flushed one bird out of a hole in a dead birch on June 9. The nest contained young.

27. *Chordeiles virginianus virginianus*. NIGHTHAWK.—Saw a number flying over the cliffs at Bay of Islands.

28. *Tyrannus tyrannus*. KINGBIRD.—A few specimens were seen along the shore of the Humber River.

29. **Empidonax traillii alnorum.** ALDER FLYCATCHER.— This species apparently had just arrived about June 10 at Bay of Islands and a few days later were quite common.

30. **Empidonax minimus.** LEAST FLYCATCHER.— A few birds seen and heard along the Humber River.

31. **Perisoreus canadensis nigricapillus.** LABRADOR JAY.— A pair or more of these birds were observed at every point and a few of them used to feed around our camp.

32. **Corvus corax principalis.** NORTHERN RAVEN.— Fairly common, especially in and about the Bay of Islands. One pair had their nest of sticks on the cliffs of Gregory Island, but the young had already left June 8.

33. **Corvus brachyrhynchos brachyrhynchos.** CROW.— We saw a few birds along the railway line.

34. **Euphagus carolinus.** RUSTY BLACKBIRD.— A nest containing four fresh eggs found June 4. It was placed five feet up in a small spruce at edge of pond.

35. **Pinicola enucleator leucura.** PINE GROSBEAK.— Several old nests of this species were found; the birds are fairly common.

36. **Loxia curvirostra minor.** CROSSBILL.— Saw two individuals at Bay of Islands.

37. **Acanthis linaria linaria.** REDPOLL.— Saw a flock of six or seven near the Humber River on June 7.

38. **Passerculus sandwichensis savanna.** SAVANNAH SPARROW.— Abundant and nesting in spruce bogs. Several nests found on June 17 sunk in caribou moss and lined with grasses. This bird was also nesting on an island many miles out at sea.

39. **Zonotrichia leucophrys leucophrys.** WHITE-CROWNED SPARROW.— We saw but three birds in stunted spruce woods.

40. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.— A common resident and abundant breeder. Many nests found on the ground in spruce woods during the month of June, the sets ranging from two to four eggs.

41. **Spizella monticola monticola.** TREE SPARROW.— A few birds seen at Bay of Islands in the spruce woods.

42. **Spizella passerina passerina.** CHIPPING SPARROW.— Common, especially at Bay of Islands.

43. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.— Not many birds seen. A nest with three incubated eggs was located on the ground in spruce woods on July 18.

44. **Melospiza lincolni lincolni.** LINCOLN'S SPARROW.— A few seen along the Humber River.

45. **Melospiza georgiana.** SWAMP SPARROW.— Only two birds noted.

46. **Passerella iliaca iliaca.** FOX SPARROW.— A very interesting and abundant species; a wonderful singer. This bird's flute-like notes were heard at all times of the day in the stunted spruce country.

47. *Iridoprocne bicolor*. TREE SWALLOW.— We saw several specimens at St. Georges Bay.
48. *Riparia riparia*. BANK SWALLOW.— Several pairs were starting to nest in some low-lying sand-pits at St. George's Bay on June 10.
49. *Mniotilta varia*. BLACK AND WHITE WARBLER.— A fairly common breeder. Nesting in spruce woods about June 15.
50. *Dendroica aestiva aestiva*. YELLOW WARBLER.— Several specimens noted at Bay of Islands amongst the alders on June 7. A nest with four badly incubated eggs was found on June 27 in a birch tree.
51. *Dendroica coronata*. MYRTLE WARBLER.— On June 9 we saw a bird of this species carrying nesting material. Not very common.
52. *Dendroica magnolia*. MAGNOLIA WARBLER.— Six or seven birds seen in the stunted spruce country along the Humber River on June 8.
53. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— Rare — only two birds noted in some mixed woods on June 8.
54. *Dendroica castanea*. BAY-BREASTED WARBLER.— Two individuals noted at Grand Lake on June 8.
55. *Dendroica striata*. BLACK-POLL WARBLER.— The most abundant warbler seen during our visit. They were everywhere in the spruce country. A nest with four fresh eggs was found on June 27 in a small spruce tree.
56. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— Heard many in the large hemlocks and pines at Bay of Islands on June 10.
57. *Dendroica palmarum hypochrysea*. YELLOW PALM WARBLER.— We heard this species singing every morning early around our camp at Grand Lake.
58. *Seiurus noveboracensis noveboracensis*. WATER-THRUSH.— Fairly abundant. A nest found on June 4 in the upturned roots of a tree. The bird had not started to lay.
59. *Geothlypis trichas trichas*. MARYLAND YELLOW-THROAT.— Common among the alders and willows along the Humber River.
60. *Wilsonia pusilla pusilla*. WILSON'S WARBLER.— Common and observed wherever we pitched our camp.
61. *Wilsonia canadensis*. CANADA WARBLER.— Fairly common in the spruce woods.
62. *Nannus hiemalis hiemalis*. WINTER WREN.— Heard this species singing at all hours of the day in damp evergreen woods.
63. *Sitta canadensis*. RED-BREASTED NUTHATCH.— Saw several in the mountainous country where they were breeding.
64. *Penthestes atricapillus atricapillus*. CHICKADEE.— Common all over the country.
65. *Regulus calendula calendula*. RUBY-CROWNED KINGLET.— Very abundant. This species, like *Passerella iliaca*, is a very interesting one and a delightful singer. For such a small body the bird has extraordinary powers of song, and from the tops of stunted spruce can be heard at all hours of the day.

On June 4 a nest with four fresh eggs was found. On June 9, 15 and 28, three others of nine eggs each, respectively, were discovered, all the nests being suspended from the branches of stunted spruce trees. They were built of moss, fine strips of bark and heavily lined with feathers of various birds.

66. *Hylocichla fuscescens fuscescens*. VEERY.— Not as common as the following species, but a few were seen at different points.

67. *Hylocichla guttata pallasii*. HERMIT THRUSH.— Abundant. A nest found on June 4 contained three fresh eggs. Two other nests were located June 14 and 16, each containing three fresh eggs. Another wonderful singer. It was worth making the trip just to hear the present species, the White-throated Sparrow, the Fox Sparrow and Ruby-crowned Kinglet sing their beautiful notes.

68. *Planesticus migratorius migratorius*. ROBIN.— Abundant everywhere. Nesting commonly the first week in June.

NOTES ON BIRDS BREEDING IN THE MOUNTAINS OF VIRGINIA.

BY H. B. BAILEY.

DURING a trip to the mountains of Virginia in July and August, 1910, I was struck by the large number of young birds seen daily on my trips, and as many species were supposed to raise only one brood in our hot climate, I decided this season to find as many evidences of actual second and third broods as possible. With this object in view I visited Goshen the first week in June and was surprised to find every species had hatched their young and many laying again, thus being as far advanced as at our home on the seaboard. The following notes were made at Goshen, June 3-10; Massanetta Springs (near Harrisonburg), July 7-28, and August 16-30; Hot Springs, July 29-August 4; Old Sweet Springs (one mile over the border in West Virginia), August 6-15. The elevation is over 2000 feet, and the season was very hot and dry. Well kept farms predominate, the woods having generally been cut off. My principal disappointment was in not finding Juncos and Thrushes on the mountain tops. The species observed (especially

sparrows) were very abundant and our noble Virginia certainly did her share towards increasing the bird population. In the mountains Wild Turkeys, Ruffed Grouse, fox squirrels, foxes and wild cats are common. From the descriptions given me by farmers' boys, Eagles and Duck Hawks breed on the cliffs.

The following list is very incomplete but may form the nucleus for other observations during the heated term some future year.

1. **Aix sponsa.** WOOD DUCK.— Not rare. Saw young about half grown, July 10.
2. **Butorides virescens.** GREEN HERON.— Common; probably raises two broods.
3. **Philohela minor.** WOODCOCK.— Rare. Seen July 24. Boys say they nest in March.
4. **Actitis macularius.** SPOTTED SANDPIPER.— Not common; old and young together in June, July 14 and in August.
5. **Oxyechus vociferus.** KILLDEER.— Quite common; young flying July 10.
6. **Colinus virginianus virginianus.** BOB-WHITE.— Abundant. Owing to the dry weather the young were two thirds grown July 7; second settings of eggs were destroyed July 29 when hay fields were cut, but the birds immediately went to laying again. They always desert the nest when cut around, even if a piece of cover is left over the nest. On August 25 a covey of young just able to fly was observed.
7. **Bonasa umbellus umbellus.** RUFFED GROUSE.— Covey of young July 10. Not rare on mountains.
8. **Meleagris gallopavo silvestris.** WILD TURKEY.— Still common. I think much crossing is done in the wilder parts; many farmers are giving up the bronze variety, owing to their straying propensities.
9. **Zenaidura macroura carolinensis.** MOURNING DOVE.— Common. Young in all stages. July 16, fresh eggs.
10. **Cathartes aura septentrionalis.** TURKEY VULTURE.— Rather common; boys claim they build on the cliffs, and Buzzard roosts are common names on sides of several mountains.
11. **Catharista urubu.** BLACK VULTURE.— Commoner than the preceding.
12. **Accipiter velox.** SHARP-SHINNED HAWK.— Not common. July 10, nest with young ready to fly.
13. **Accipiter cooperi.** COOPER'S HAWK.— Not common. Several seen. Not a favorite with farmers.
14. **Buteo lineatus lineatus.** RED-SHOULDERED HAWK.— Breeds sparingly, and probably the Red-tailed Hawk also.
15. **Falco sparverius sparverius.** SPARROW HAWK.— Not common until August when young were full grown.

16. *Aluco pratincola*. BARN OWL.— One taken a few days before my arrival in an old barn.
17. *Strix varia varia*. BARRED OWL.— Rather common.
18. *Otus asio asio*. SCREECH OWL.— Common.
19. *Bubo virginianus virginianus*. GREAT HORNEDED OWL.— Common. Destructive to poultry where so many roost in trees, as very few farmers have regular houses for them.
20. *Coccyzus americanus americanus*. YELLOW-BILLED CUCKOO.— Rare. Young hatched July 7.
21. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.— Not common. Two broods; feeding young in August.
22. *Ceryle alcyon*. BELTED KINGFISHER.— Common. No signs of a second brood.
23. *Dryobates villosus auduboni*. HAIRY WOODPECKER.— Rare. Only one brood.
24. *Dryobates pubescens pubescens*. DOWNY WOODPECKER.— Two broods; small young in nest June 10.
25. *Phloeotomus pileatus pileatus*. PILEATED WOODPECKER.— Rarely seen; heard often, and one seen August 2.
26. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.— Very common. Possibly three broods. July 7, nest contained eggs which hatched the 10th; young left the nest on the 20th; seen feeding young in August.
27. *Centurus carolinus*. RED-BELLIED WOODPECKER.— Not common. Only one brood.
28. *Colaptes auratus auratus*. FLICKER.— Common. Raises two broods.
29. *Antrostomus vociferus vociferus*. WHIP-POOR-WILL.— Raises two broods. Eggs, July 7; hatched 10th; not heard calling after 15th.
30. *Chordeiles virginianus virginianus*. NIGHTHAWK.— Two broods. Not heard after July 23.
31. *Chætura pelagica*. CHIMNEY SWIFT.— Very common. One nested inside of an old mill; young gone July 10.
32. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.— Abundant. No signs of second brood.
33. *Tyrannus tyrannus*. KINGBIRD.— Common; two broods.
34. *Myiarchus crinitus*. CRESTED FLYCATCHER.— Common. Feeding young in August.
35. *Sayornis phoebe*. PHOEBE.— Abundant. June 6, young in all stages and fresh eggs. July 7, young in nest; feeding young in August.
36. *Myiochanes virens*. WOOD PEWEE.— Undoubtedly two broods. Still singing Aug. 6.
37. *Empidonax virescens*. ACADIAN FLYCATCHER.— Rare. One heard and seen at Goshen in June and at Hot Springs in August; probably commoner in suitable localities near water.
38. *Empidonax minimus*. LEAST FLYCATCHER.— Rare. July 10 one heard and seen in an Orchard.

39. *Cyanocitta cristata cristata*. BLUE JAY.—Abundant. No signs of second brood.
40. *Corvus brachyrhynchos brachyrhynchos*. CROW.—Abundant. One brood — how fortunate!
41. *Molothrus ater ater*. COWBIRD.—Young birds common July 7; but I have never found their eggs in late settings.
42. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.—Very common. Young in nest July 7; eggs hatching July 15.
43. *Sturnella magna magna*. MEADOWLARK.—Common. Nest and eggs found July 20; destroyed by hogs; July 22–23, new nest, female flushed.
44. *Icterus spurius*. ORCHARD ORIOLE.—Common. Two broods.
45. *Icterus galbula*. BALTIMORE ORIOLE.—Rare; only one seen.
46. *Quiscalus quiscula seneus*. BRONZED GRACKLE.—Feeding young July 23.
47. *Astragalinus tristis tristis*. GOLDFINCH.—Abundant. No signs of breeding until Aug. 10, at Old Sweet Springs, when a nest with 4 eggs, and one with 6 eggs were found.
48. *Passer domesticus*. ENGLISH SPARROW.—Everywhere. Aug. 25, many young in nests in the top of an old shed.
49. *Poocetes gramineus gramineus*. VESPER SPARROW.—Very common. Raises probably three broods. Large young June 6; fresh eggs July 7–17, Aug. 2, and young in nests.
50. *Ammodramus savannarum australis*. GRASSHOPPER SPARROW.—Very common. Large young flying June 10 and July 7; fresh eggs July 29; singing all through August.
51. *Passerherbulus henslowi henslowi*. HENSLOW'S SPARROW.—Very common at Massanetta; young abundant July and August; 3 eggs, July 16.
52. *Spizella passerina passerina*. CHIPPING SPARROW.—Abundant. Two and three broods; young in nests June, July and August.
53. *Spizella pusilla pusilla*. FIELD SPARROW.—Very common. Three broods. Eggs, July 27, August 1, August 20; young in nests June, July, and August.
54. *Melospiza melodia melodia*. SONG SPARROW.—Very common. Three broods. Eggs, July 9–27. Young hatched the 9th, left nest on the 20th; young in nests July and August.
55. *Pipilo erythrophthalmus erythrophthalmus*. TOWHEE.—Common. Two broods; feeding young July 10.
56. *Cardinalis cardinalis cardinalis*. CARDINAL.—Common. Young in nest July 27.
57. *Guiraca caerulea caerulea*. BLUE GROSBEAK.—Two or three broods; young in nest July 10–August 2.
58. *Passerina cyanea*. INDIGO BUNTING.—Common. Three broods. Young and eggs, June 6, and in July; feeding young August 1.

59. *Piranga erythromelas*. SCARLET TANAGER.— Rare at Goshen in June; rare at Hot Springs.
60. *Piranga rubra rubra*. SUMMER TANAGER.— Several seen in oak woods, in June and July.
61. *Progne subis subis*. PURPLE MARTIN.— Not many boxes are put up for them.
62. *Petrochelidon lunifrons lunifrons*.— CLIFF SWALLOW.— Only one colony on a barn by the river.
63. *Hirundo erythrogastra*. BARN SWALLOW.— Abundant. All nests were empty July 10.
64. *Riparia riparia*. BANK SWALLOW.— Only seen by the river.
65. *Bombycilla cedrorum*. CEDAR WAXWING.— Common. June, July, and August. No signs of building until a nest was found building July 29, in an orchard. August 4 contained four eggs.
66. *Vireosylva olivacea*. RED-EYED VIREO.— Very common. Eggs and young in June; mostly silent after July 10.
67. *Vireosylva gilva gilva*. WARBLING VIREO.— Rare.
68. *Lanius flavifrons*. YELLOW-THROATED VIREO.— Nest in maple July 15, young just leaving.
69. *Vireo griseus griseus*. WHITE-EYED VIREO.— Rather rare at Goshen in June; not heard afterwards.
70. *Mniotilta varia*. BLACK AND WHITE WARBLER.— Common. Not singing after June.
71. *Dendroica aestiva aestiva*. YELLOW WARBLER.— Very common, breeding near houses; still singing August 1.
72. *Dendroica virens*. PINE WARBLER.— Common in pine woods; rarely heard in July.
73. *Dendroica discolor*. PRAIRIE WARBLER.— Common. Stopped singing July 13.
74. *Seiurus aurocapillus*. OVEN-BIRD.— Young in nest July 10; none singing later.
75. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.— Heard singing at Hot Springs in a deep glen, August 4; common at Goshen in June.
76. *Geothlypis trichas trichas*. MARYLAND YELLOW-THROAT.— Rare at Goshen in June; not seen nor heard later.
77. *Icteria virens virens*. YELLOW-BREASTED CHAT.— Common. Stopped singing July 18.
78. *Wilsonia citrina*. HOODED WARBLER.— Common in June; none heard later on.
79. *Setophaga ruticilla*. REDSTART.— Rather rare. Not heard after July 10; feeding young August 4.
80. *Mimus polyglottos polyglottus*. MOCKINGBIRD.— Rare. Young in nest July 24; very common around Staunton July 28.
81. *Dumetella carolinensis*. CATBIRD.— Abundant. Three broods; young still in nest August 1.

82. *Toxostoma rufum*. BROWN THRASHER.— Very common. Young in nest July 17.

83. *Thryothorus ludovicianus ludovicianus*. CAROLINA WREN.— Not common. Eggs June 6; feeding young August 6.

84. *Thryomanes bewickii bewickii*. BEWICK'S WREN.— Rare. Young hatched June 3; singing in July.

85. *Troglodytes aëdon aëdon*. HOUSE WREN.— Common. Young in nest July 27.

86. *Sitta carolinensis carolinensis*. WHITE-BREASTED NUTHATCH.— Common. No signs of second brood.

87. *Sitta pusilla*. BROWN-HEADED NUTHATCH.— Rare at Massanetta in July; seen at Goshen in June.

88. *Bæolophus bicolor*. TUFTED TITMOUSE.— Rather common; large young in June.

89. *Penthestes carolinensis carolinensis*. CAROLINA CHICKADEE.— Common. Apparently raise only one brood.

90. *Polioptila cærulea cærulea*. BLUE-GRAY GNATCATCHER.— Common. Not singing after June 6.

91. *Hylocichla mustelina*. WOOD THRUSH.— Common. June 6, eggs and young in nest and flying; July 26, young in nest. Silent after July 15.

92. *Hylocichla fuscescens fuscescens*. VEERY.— Rare; heard only at Hot Springs, August 4.

93. *Planesticus migratorius migratorius*. ROBIN.— Very abundant; probably three broods.

94. *Sialia sialis sialis*. BLUEBIRD.— Abundant. Eggs hatching July 16, and large young, same date.

NOTES ON THE FLIGHT OF GULLS.

BY WILLIAM BREWSTER.

EVERY ornithologist knows, of course, that Gulls are past masters of the art of making headway against strong winds. These they commonly meet and overcome either by flying straight and rather low over the water, with frequent if not incessant wing beats, or by alternately soaring upward and swooping downward on set wings, apparently utilizing as much as possible the momentum acquired by such evolutions or by intermittent flapping, and seeming to follow, with admirable skill and judgment, the lines of least resistance. Under certain conditions, however, they progress by means other than those just mentioned and with surprising ease and celerity, as I have twice witnessed to exceptionally good advantage.

On the first occasion — October 6, 1909 — I was crossing from Liverpool to Boston in the Cunard steamship 'Ivernia' when, after passing the southeastern extremity of Ireland and laying our course to the westward, we were followed, as is usual in those waters, by a perfect swarm of Gulls — chiefly little Black-headed and Herring Gulls with a few Lesser Black-backed and Mew Gulls. Gliding, for the most part, on set and motionless wings close above and around us they kept up with us without apparent effort for a distance of more than one hundred miles although our ship was heading within two points of a heavy wind and ploughing through a tumultuous sea at a speed of sixteen miles an hour. There were nearly always a dozen or more of them floating not more than twelve or fifteen feet over our heads as we stood on the upper deck and keeping so nearly the same positions in relation to our own that whenever we regarded them intently, without taking note of other surroundings, it was difficult to realize that either they or we were not quite motionless. They looked, indeed, like so many admirably stuffed and mounted Gulls suspended by invisible wires. At such short distances and in bright sunlight I watched them for minutes at a time without detecting any movement of their wings, other than that due to occasional flexing or similarly slight readjust-

ment, while their vertical deflections from a horizontal plane of flight were never greater than ten or fifteen inches. Yet all the while the beautiful birds were keeping exact pace with us and moving at a known speed of sixteen miles an hour against a wind having an estimated velocity of considerably more than that. Nor was this the best that they could do for every now and then one which had fallen behind the rest would overtake its companions without flapping or other visible effort although going — perhaps for hundreds of yards — at almost double their rate of speed. How could such a thing be? It seemed unbelievable yet the fact was before our eyes and not to be discredited, however difficult to understand or explain. Those of us who first witnessed and afterwards discussed it agreed in thinking that the gliding birds could not acquire any considerable amount of their momentum by their slight and infrequent swoops or occasional wing strokes. Indeed they seemed, oddly enough, to lose rather than to gain headway whenever they flapped vigorously. It was suggested that their chief if not only means of propulsion must be that of the force of the wind, acting on their set wings somewhat as it does on the sails of a vessel, but objected that no sailing vessel can head within three points of the wind and move forward through the water or fail, when going to windward, to make more or less leeway; whereas the Gulls headed within two points and had no perceptible drift to leeward.

On August 2, 1911, I was again returning from England to America — this time in company with my friends Dr. and Mrs. Glover M. Allen — when our steamship, the White Star liner 'Arabic' was attended, during most of the afternoon and for a distance of above a hundred miles off the south coast of Ireland, by from fifty to two hundred Gulls, the number varying from hour to hour within these limits. Nearly all were adult Herring Gulls still in full nuptial plumage. A few followed the creamy wake of the ship or poised directly over her just to the rear of her smoke stack but the majority kept abreast of her to the windward side, the somewhat sheltered lee side being persistently avoided. On a level with her upper deck or a little above it, they were generally and rather evenly distributed — although more thickly in places than in others — all the way from her stern to amidships, some

keeping within a yard or two of the rail, others thrice that distance off, still others fifty or more yards out over the water. Their respective positions in relation to each other and to the ship were so accurately and systematically maintained that whenever I got one of them in line with any fixed object on the deck I could often hold it there, without myself moving again, for several successive minutes. At first, when the wind was coming from about two points off our larboard bow and blowing not more than twenty miles an hour, the Gulls flapped rather frequently although most of them glided on set wings the greater part of the time. As the afternoon wore on the wind shifted and freshened until it came within a point and a half of being dead ahead — in the opinion of our Boatswain — and attained a velocity of thirty-five miles an hour — according to our Captain. This change was gradual, not abrupt. It was accompanied by a marked and most interesting progressive change in the manner of flight and general appearance of the Gulls. As the gale increased they flapped their wings less and less often, until most, if not all of them, were gliding ceaselessly, minute after minute, over distances certainly exceeding a mile, without a single wing beat but not without changes or readjustments in the bend or the inclination of the wings which took place not infrequently and often were very obvious. It was a rarely impressive and beautiful, as well as mysterious, sight — that of this orderly throng of silent, stately, almost snow-white birds, moving majestically on a perfectly level plane, at a speed of fifteen knots an hour, against a raging wind, yet making no visible muscular effort which could in any way account for such progress. Even more surprising was it to see, every now and then, one of them leave the rest and, going two feet to their one, forge on ahead of them all perhaps to the bows of the steamer and beyond, yet without once beating its wings. They seemed, indeed, to now have abundant speed *held in reserve* and to be able to retard or accelerate it at will, without obvious means of so governing it. Dr. Allen, who watched them with me for a time but not, unfortunately, when the gale reached its height and they were doing their best, fully shared my conviction that they could not possibly be making use of previously acquired momentum but that the wind itself must furnish their chief if not only means of propulsion. After he had

gone below it shifted to almost dead ahead and blew for half an hour or more with extreme violence. The Gulls were now heading, I should say, within a point and a half of it yet continuing to sail into it with undiminished ease and speed. The gradual increase in its strength and in the duration of their gliding flights, was accompanied by a very noticeable progressive change in the way their wings were held. This is difficult to describe but essentially it may be said to have consisted (1) in the more backward set of the whole wing; (2) in the greater crooking or bending of the wing at the carpal joint; (3) in the much more decided downward trend of the flight quills, especially the secondaries, which were so bent down and forward towards their tips as to give the wing when viewed from in front a conspicuously incurved or hollowed aspect similar to that shown by Hawks, Pigeons, etc., caught by the camera in the act of "back-pedaling" just before alighting. At the height of the gale the Gulls' wings were held so very far to the rear of their usual position that very much of the body was shown in advance of where they seemed to join it. The neck, too, appeared to be exceptionally elongated and its contour plumage, with that of the head and body, unusually compressed. In other and briefer words the birds seemed to have advanced as far as might be their centres of gravity, to have reduced as much as possible the resistance offered by their heads, necks and bodies to the wind, and to be employing its force to drive them for miles, almost straight into it, by merely letting it beat against their rigid and peculiarly placed and adjusted wings. As I stood watching half a dozen or more of them only a few yards away, sailing serenely and impassively through gusts which forced me to cling with both hands to a railing to avoid being blown bodily across the deck, it occurred to me that their swift and effortless progress might be due, at least in part, to the impact of the wind on the terminal portions of their depressed and stiffly-held primaries and secondaries. That these were incessantly agitated and sprung upward by the wind was plainly to be seen. They must be similarly bent, of course, whenever there are strong, downward strokes of the wings. Photographs of large, slow-flapping birds engaged in ordinary flight, fail to indicate that such wing strokes are often directed sufficiently backward to be altogether or even largely in the nature of rowing movements. On

experimenting with severed wings stiffened by drying I have found that when held firmly in the hand by their outer (*i. e.* bony) edges and struck smartly downward they give one very decidedly the impression that there is a resultant and by no means inconsiderable *level* thrust which in the living bird would be directed forward and might help materially to speed it on its way. If impetus may be so derived it must be due to the leverage of the long, elastic flight quills. Firmly attached at their bases to the rigid, bony structure along the edge of the wing but free towards their tips to be uplifted by impact on the air, these feathers perhaps act somewhat as a crowbar is made to serve by the mason when, after inserting one of its ends under a heavy stone, he lifts at the other end and thereby forces the stone forward over the ground without raising it. Whether or not the suggestions just hazarded have any value — a friend has characterized them as no less absurd than the old time assumption that a man may lift himself by his boot straps — there is, I think, little or no doubt that the wind constantly fills the concave wings of the gliding Gulls much as it does the sails of close-hauled vessels and with similar results but with this essential difference; that whereas its force is exerted for the most part laterally on the vessels' sails and opposed by the side thrust of their keels or centreboards in the water, it must have chiefly a lifting effect on the wings of the Gulls and be counteracted by the weight of their bodies bearing downward. Hence we may infer that in the case of these birds forward movement is the resultant of two component forces, that of wind and of the attraction of gravitation.

The theory last stated is not novel of course. It has recently been taken up and in certain ways effectively demonstrated and supported by G. F. Tydeman¹ who, writing in French and making extensive use of abstruse mathematical calculations accompanied by diagrams to illustrate them, deals particularly and most interestingly with the flight of sea birds. His observation of it has apparently been so much more extensive than mine that I hesitate to differ with him respecting any of his assumed facts or resultant

¹ *Le Vol. Plané Des Oiseaux* par G. F. Tydeman. Archives Néerlandaises des Sciences Exactes et Naturelles Publiées par La Société Hollandaise Des Sciences à Harlem. Series III B (Sciences naturelles), Tome I, 1^e et 2^e Livraisons. La Haye, 1911.

conclusions.¹ I cannot accept all of these, however, and I am especially unwilling to endorse his belief that birds gliding to windward depend for means of propulsion largely if not wholly on uplift afforded by powerful ascending currents of air such as must always rise above a vessel when heavy wind is striking against and deflected from, her sides. The possibility of this was thought of and at first more or less favorably considered by Dr. Allen and me as we watched the Gulls from the deck of the 'Arabic,' a month or more before Mr. Tydeman's article came to our notice. But I dismissed it altogether from my mind after repeatedly seeing birds hundreds of yards behind the steamer, or fifty or more yards to one side (always the windward one) of her, or even well in advance of her, gliding on set wings in precisely the same manner and quite as ceaselessly as those which hung about her flanks. It seems inconceivable that her presence or movement could have caused vertically rising currents of air to be regularly maintained at such distances from her as those just mentioned, or that they could have been thus constantly and generally maintained by other influences when the ocean all about her was swept by a wind blowing over thirty miles an hour. I even doubt if they extended much above her upper deck for there I was lashed incessantly in the face by what seemed to be horizontally-racing wind, while several of the Gulls were often sailing fifteen or twenty feet higher still, perhaps directly over me. On the other hand it must be admitted that I have never known any of these birds to glide far to windward except when accompanying a steamship, a fact which apparently lends some support to Mr. Tydeman's contention, although not necessarily having such significance since it may reasonably be interpreted in other ways.

Conducted of necessity through opposing and invisible air currents constantly varying in force and also somewhat in direction the gliding flight of the Gulls seems very wonderful, however it be explained. It would be impossible of execution were not the birds endowed with some intuitive sense which enables them to instantly

¹ So many of these are in close accord with mine that it may be well for me to state that the present article is based almost wholly on observations and impressions recorded in my Journal or other notebooks before I knew anything about Mr. Tydeman. It is true that some of my views have been modified since his article was brought to my notice but this has been due not so much to its influence as to helpful criticisms and suggestions contributed by ornithological friends.

and accurately adjust and readjust the set of their wings and the equilibrium of their heavy bodies so as to meet in precisely the most effective way, without either loss or gain of headway, each successive gust and interval of comparative calm. With regard to individual proficiency and endurance in performing and maintaining such flight little if any differences were noticeable among the one hundred or more Herring Gulls who followed the 'Arabic' on the afternoon of August 2, 1911. Nor were two Lesser Black-backed Gulls (*Larus fuscus*) who accompanied them inferior to them in these respects. But two superb Great Black-backed Gulls (*Larus marinus*) who joined the throng at the height of the gale and kept along with us for half an hour or more just above the level of the upper deck flew, all the while, as most Gulls do on ordinary occasions, that is by alternate flapping and sailing, beating their wings vigorously every few seconds. Quite evidently the art of gliding far into the wind on set wings was beyond either their knowledge or their power, else surely they would have resorted to it, with scores of birds close about them practising it. Whenever, as not infrequently happened, the Herring Gulls descended to within ten or fifteen feet of the crests of the waves they, too, seemed unable to advance against the wind without frequent, vigorous wing strokes. At such low levels the gliding flight appeared, indeed, to be never even attempted by any one of them, a fact doubtless possessing no little significance if only one knew just how to interpret it.

Before sunset our escort of Gulls became much reduced and before dark all the birds had left us. Thus they did not follow us quite out of sight of the shores of Ireland where, no doubt, many of them had nests with eggs or young. No others of their kind rejoined us the following morning nor were any again seen until we neared the coast of Massachusetts.

My readers will understand, of course that what I have had to say in the way of attempted explanation of the movement of gliding Gulls represents little more than personal inference and opinion based on field observations made under favorable conditions but extending over only two half days. Hence it should be taken as suggestive rather than assertive. The problem to which it relates is too difficult to be dealt with thus superficially and at the same time effectively. Before attempting seriously to solve the

mystery one should study the metaphysics of the general subject of flight and familiarize himself with its voluminous literature. For so onerous a task I have had insufficient time and possibly not much real inclination. Being thus handicapped I should perhaps have abstained altogether from theorizing. But the temptation was irresistible and if, by yielding to it, I have originated nothing of value there will at least have been little if any harm done — save, perchance, to my scientific reputation.

TWENTY-NINTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE Twenty-ninth Stated Meeting of the American Ornithologists' Union convened in Philadelphia, Pa., Monday evening, November 13, 1911. The business meeting was held in the Council Room, and the public sessions, commencing Tuesday, November 14, and lasting three days, were held in the lecture hall of the Academy of Natural Sciences.

BUSINESS SESSION.—The meeting was called to order by the President, Mr. Edward W. Nelson. Eighteen Fellows were present. The Secretary's report gave the membership of the Union at the opening of the present Stated Meeting as 887, constituted as follows: Fellows, 48; Honorary Fellows, 11; Corresponding Fellows, 60; Members, 78; Associates, 690.

During the year the Union lost sixty-six members, eight by death, twenty-four by resignation, and thirty-four for nonpayment of dues. The deceased members include one Fellow, one Honorary Fellow, two Corresponding Fellows, two Members, and two Associates, as follows:

Henry Augustus Purdie,¹ a Fellow, and one of the Founders of the Union, who died in Boston, March 29, 1911, in his 71st year.

Dr. Adolf Bernhard Meyer,² an Honorary Fellow, who died in Berlin, Germany, February 5, 1911, at the age of 71 years;

¹ For an obituary notice, see Auk, XXVIII, p. 387; also Memorial Address in the present number.

² For an obituary notice, see Auk, XXVIII, p. 519.

Capt. George E. Shelley,¹ a Corresponding Fellow, who died November 29, 1910, in London, England, at the age of 70 years; Dr. Gustav Edler von Hayek,² a Corresponding Fellow, who died in Vienna, January 9, 1911, in the 76th year of his age; Dr. Charles Otis Whitman,³ a Member, who died in Chicago, Ill., December 6, 1910, at the age of 68; Manly Hardy,⁴ a Member, who died in Brewer, Maine, December 9, 1910, in his 79th year; and the following Associates: Francis Wm. Rawle, of Bryn Mawr, Pa., who died June 12, 1911, and William Roth Wister, of Philadelphia, Pa.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

Frank M. Chapman was elected President; A. K. Fisher and Henry W. Henshaw, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Ruthven Deane, William Dutcher, F. A. Lucas, Chas. W. Richmond, Thos. S. Roberts, Witmer Stone, and Wilfred H. Osgood, members of the Council.

Drs. Alphonse Dubois, Brussels, Belgium; C. E. Hellmayr, Munich, Germany; Hermann von Ihering, São Paulo, Brazil; Herman Schalow, Berlin, Germany, and W. P. Pycraft, London, England, were elected Honorary Fellows; Gregory M. Mathews, London, England; Dudley Le Souëf, Melbourne, Australia; John Lewis Bonhote, Hempstead, England, and John G. Millais, Hordsham, England, were elected Corresponding Fellows, and the following eighty persons were elected Associates, namely:

Adams, Benjamin, New York City.
Aldrich, Frank W., Bloomington, Ill.
Alexander, Miss Annie M., Piedmont, Calif.
Anthony, Harold E., New York City.
Babcock, Dean, Estes Park, Colo.
Baker, John Hopkinson, Cambridge, Mass.
Ball, Dr. J. P., Frankford, Pa.
Banks, Miss Martha Burr, Westport, Conn.
Batten, George, Montclair, N. J.
Bignell, Mrs. Effie, New Brunswick, N. J.

¹ For an obituary notice, see *Auk*, XXVIII, pp. 387-388.

² For an obituary notice, see *Auk*, XXVIII, p. 388.

³ For an obituary notice, see *Auk*, XXVIII, p. 149.

⁴ For an obituary notice, see *Auk*, XXVIII, pp. 149-150.

Booth, Sherman M., Glencoe, Ill.
Borland, Wm. G., New York City.
Brown, Philip Greely, Portland, Me.
Browning, Wm. Hull, New York City.
Bubier, Geo. M., Lynn, Mass.
Burr, Freeman Foster, East Haven, Conn.
Chapman, Roy, Minneapolis, Minn.
Cheesman, Morton R., Salt Lake City, Utah.
Clay, Charles Irvin, Eureka, Calif.
Craig, Leon T., Mars Hill, Me.
Cushman, Mrs. John M., Jamestown, N. Y.
Dickey, Donald R., Dubuque, Iowa.
Duryee, Miss Anna B., Newark, N. J.
Dwight, Dr. E. W., Boston, Mass.
Dyer, Edward Tiffany, Southampton, N. Y.
Ekblaw, Walter Elmer, Urbana, Ill.
Francis, Geo. A., Bridgeport, Conn.
Fuguet, Dallett, Upper Montclair, N. J.
Gianini, Chas. Alfred, Poland, Herkimer Co., N. Y.
Gordon, Harry Edgar, Rochester, N. Y.
Greene, Miss Mary Amory, Croton-on-Hudson, N. Y.
Gutsell, James S., Ithaca, N. Y.
Hallett, Geo. Hervey, Jr., Lansdowne, Pa.
Harris, Harry, Kansas City, Mo.
Hartman, Corpl. P. J., Honolulu, Hawaii.
Hersey, F. Seymour, Taunton, Mass.
Holt, Ernest Golsan, Barachias, Ala.
Hudson, Mrs. Katharine West, Cambridge, Mass.
Johnston, J. W., Rochester, N. Y.
Kendall, H. F., M. S., Virginia, Minn.
Kilburn, Frank M., Ithaca, N. Y.
Lambert, Dr. A. E., Middlebury, Vt.
Linton, Miss Ida L., Roxbury, Mass.
Mills, Dr. Herbert R., Jacksonville, Fla.
Mitchell, Catharine Adams, Riverside, Ill.
Moore, Henry D., Haddonfield, N. J.
More, R. L., Vernon, Texas.
Morley, S. G., Boulder, Colo.
Morris, Sidney V., Bristol, Pa.
Paladin, Arthur, Albany, N. Y.
Parsons, Robert L., So. Orange, N. J.
Pepper, William, M. D., Philadelphia, Pa.
Pierrepont, John J., Brooklyn, N. Y.
Post, William Stone, Bernardsville, N. J.
Rathborne, Richard Charles, Newark, N. J.
Robbins, Royal Elisha, Brookline, Mass.

Robertson, Howard, Los Angeles, Calif.
 Roper, Kenyon, Steubenville, Ohio.
 St. John, Prof. Edward Porter, Hartford, Conn.
 Sanborn, Colin Campbell, Highland Park, Ill.
 Schroeder, Arthur, Montclair, N. J.
 Sheldon, Charles, New York City.
 Shelton, Alfred, Petaluma, Calif.
 Small, Harold Wesley, Bethel, Me.
 Smith, Austin Paul, Brownsville, Texas.
 Spelman, Henry M., Cambridge, Mass.
 Stockbridge, Chas. A., Fort Wayne, Ind.
 Stone, William Dudley, Fayetteville, Ark.
 Strode, William S., M. D., Lewistown, Ill.
 Taylor, B. F., Columbia, S. C.
 Taylor, Walter Penn, Berkeley, Calif.
 Tylor, J. E., Washington, D. C.
 Victor, Edward W., Brooklyn, N. Y.
 Weed, Benjamin, San Francisco, Calif.
 Welles, Charles S., Elwyn, Pa.
 White, Wilson Carlisle, Chester, S. C.
 Whitney, Byam, Cambridge, Mass.
 Williston, Mrs. Samuel, Belmont, Mass.
 Young, Miss Harriet Tible, Hinsdale, Ill.
 Young, John Paul, Youngstown, Ohio.

Drs. Allen, Dwight, Merriam and Richmond and Messrs. Brewster, Ridgway and Stone were re-appointed 'Committee on Classification and Nomenclature of North American Birds.'

Dr. A. K. Fisher, E. W. Nelson and Dr. Chas. W. Richmond were appointed 'Committee on Bird Protection.'

PUBLIC SESSIONS. *First Day.*—The meeting was called to order by the President, Mr. Chapman. An address of welcome was made by Dr. S. G. Dixon, on behalf of the Academy of Natural Sciences.

The papers read during the morning session were as follows:

'In Memoriam — Henry A. Purdie,' by William Brewster.

'The Validity of the Red-legged subspecies of Black Duck,' by Dr. Chas. W. Townsend.

'Description of a New Ptarmigan from the Aleutian Islands,' by Arthur C. Bent.

'The Status of the Blue-eared Jay (*Aphelocoma cyanotis*) in Texas,' by Harry C. Oberholser.

'The Relation of Genera to Faunal Areas,' by Dr. Spencer Trotter.

'New Light on the Name of the Traill Flycatcher,' by Harry C. Oberholser.

'Field Notes on "recognition marks" in certain species of Birds,' by John Treadwell Nichols. Remarks followed by Dr. C. W. Townsend, Messrs. Osgood, Fuertes, McAtee, and the author.

'Birds in the Markets of Southern Europe,' by Dr. Louis B. Bishop. Remarks followed by Messrs. Osgood, McAtee, Wm. Palmer, and Gronberger, Drs. Trotter and Townsend, Rev. Wm. R. Lord, and the author.

The first paper of the afternoon was:

'A Scheme to increase Insectivorous Birds,' by Rev. Wm. R. Lord.

The remaining papers, all illustrated by lantern slides, were:

'Recent Field Studies of some Ecuador Hummingbirds,' by S. N. Rhoads.

'An Automatic English Sparrow Trap,' by Chas. W. Miller.

'Exhibition of Lantern Slides and Moving Pictures of Birds,' by Clinton G. Abbott.

In the evening an informal reception was given the members of the Union by Mr. and Mrs. Wm. L. Baily at their home in Ardmore, Pa.

Second Day.—The meeting was called to order by the President.

The papers of the morning session were:

'Some Notes on the Egg-laying Habits of the Cowbird (*Molothrus ater*),' by Chas. W. Miller. Remarks followed by Messrs. Bowditch, Bent and Bailey, Rev. H. K. Job, and the author.

'Some Nesting Habits of the Least Sandpiper,' by Robert Thomas Moore. Illustrated by lantern slides.

'Report of the "American Bird Banding Association,"' by W. W. Grant.

'Autochromes of Land Birds and Sea Birds,' by Dr. Frank Overton and Francis Harper. Illustrated by lantern slides.

'Results of a Brief Visit to the Aleutian Islands and Bering Sea,' by Arthur C. Bent. Illustrated by lantern slides.

The following papers were presented at the afternoon session:

'Bird Notes from Pisgah Forest, N. C.,' by Harry C. Oberholser.

Illustrated by lantern slides. Remarks followed by Messrs. Brewster, Rhoads, and Forbush.

'Certain Asiatic Birds,' by C. William Beebe. Illustrated by lantern slides.

'Notes on the Flight of Gulls,' by William Brewster.

'An Ornithological Reconnaissance in Colombia,' by Frank M. Chapman. Illustrated by lantern slides.

'Call Notes of Tropical American Birds,' audibly illustrated, by Louis Agassiz Fuertes.

In the evening the visiting members of the Union were invited to a Smoker at the Academy, tendered by members of the Ornithological Section.

Third Day.—The meeting was called to order by the President. The papers of the morning were:

'Flight Maneuvers of the Gannet and Kittiwake,' by Robert Thomas Moore. Illustrated by lantern slides.

'A Trip to the Magdalens,' by Wm. L. Baily. Illustrated by lantern slides.

'Bird Life on the Paramo of Mount Pichincha, Ecuador,' by S. N. Rhoads.

'The Propagation of Bob-white,' by Herbert K. Job. Illustrated by lantern slides. Remarks followed by Messrs. Fuertes, Pearson, Baily, Palmer, Rhoads, and Bowdish, Drs. Field and Fisher, and the author.

'The Classification of Kingfishers, with Particular Reference to the Genus *Ceryle*,' by W. De Witt Miller.

The papers of the afternoon (the closing) session, all illustrated by lantern slides, were:

'Bird Photography from Staten Island; in New York City; Gardiner's Island, N. Y., and Certain Virginia Coast Islands,' by Howard H. Cleaves.

'Bird Life in the Arizona Desert,' by Wm. L. Finley.

'Notes on the Birds of the Panama Canal Zone,' by Edward A. Goldman.

'Some Birds of the Orinoco Delta, Venezuela,' by Stewardson Borwn.

'The Hooting of the Blue Grouse,' by Vernon Bailey.

The following papers were read by title:

'The Gulls of Four Brothers Island,' by B. S. Bowdish.

'A Last Word on the Passenger Pigeon,' by Prof. C. F. Hodge.

'Possible Cause of the Extinction of the Labrador Duck,' by E. H. Forbush.

'Do Birds change their Routes of Migration?', by E. H. Forbush.

'Notes on the Laysan Finch,' by Prof. Hubert Lyman Clark.

'Last Days of the Wild Pigeon in Sullivan County, Pa.,' by Herman Behr.

'The Golden Plover (*Charadrius dominicus dominicus*) on the Coast of South Carolina,' by Arthur T. Wayne.

'Vagaries in Nesting of the House Wren,' by Wilbur F. Smith.

Resolutions were adopted thanking the Academy of Natural Sciences for the use of a hall for a place of meeting for the Union, and for other courtesies extended; to the Local Committee and other Philadelphia ornithologists for the cordial welcome and most generous hospitality shown visiting members and friends of the Union; to Mr. and Mrs. Wm. L. Baily for their kindness in entertaining the members of the Union at their home in Ardmore, Pa., and to the Zoölogical Society of Philadelphia for its kind invitation to visit the Gardens of the Society.

The following resolutions were unanimously adopted by the Council, November 13, 1911.

RESOLVED: That in regretfully accepting the resignation of Dr. J. A. Allen as Editor of 'The Auk,' on account of impaired health, the Council of the American Ornithologists' Union desires to express its high appreciation of the long and faithful service rendered by him. Taken in connection with his prior editorship of the 'Bulletin of the Nuttall Ornithological Club,' the predecessor and virtually the first series of 'The Auk,' Dr. Allen has served for a period of thirty-six years, a term of continuous editorial service rarely equalled in ornithological annals. It is not too much to say that the high position 'The Auk' has attained among the leading ornithological journals of the world is very largely due to the wise, able, and conscientious manner in which his editorial duties have been performed.

RESOLVED: That the Council of the American Ornithologists' Union desires to place on record its great regret that illness should prevent the attendance at this meeting of Mr. William Dutcher, long a member of the Council. He is very much missed and

tenderly remembered, and the hope is expressed that his health will soon be restored.

Mr. Witmer Stone was elected to succeed Dr. Allen as Editor of 'The Auk.'

The next meeting of the Union will be held in Cambridge, Mass., the date to be determined later.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

The Laughing Gull at Marshfield, Massachusetts.— On May 30, 1911, while making a trip along the "South Shore," I observed at Marshfield a single Laughing Gull (*Larus atricilla*) sitting on the water a little distance out. The black head and the solid black outer primaries showed up very conspicuously, making identification sure. Also it was noticeably smaller than the Herring Gulls which were near it. This is, I believe, a new record, not only for Marshfield, but also for Plymouth County, of the Laughing Gull, as I have not been able to find any previous date.

Again, on July 29, 1911, while Mr. J. Archibald Hagar, Mr. H. D. Mitchell, and I were sitting on the cliff at the mouth of the North River, we saw four black-headed gulls fly up into the mouth of the river. We watched them for some time and identified them plainly as Laughing Gulls.

The next day (the 30th), we three, accompanied by Mr. J. C. Hagar, in a boat on the South River, near the mouth, saw a pair of these same gulls on the flats, so near that we could see the white eye-ring and the reddish bill. They were very handsome birds and seemed to be much smaller than the Herring Gulls which were around them.

It is to be hoped, and these records may possibly indicate that the Laughing Gull is extending its range a little farther northward in Massachusetts.—
HAROLD L. BARRETT, *Jamaica Plain, Mass.*

Franklin's Gull (*Larus franklini*) at Philadelphia.— Mr. Philip Laurent recently submitted to me for identification a gull recently presented to him by Mr. Charles Liebeck who had shot it October 22, 1911, on the Philadelphia "neck," the open swampy ground lying below the built up portion of the city, above the juncture of the Delaware and Schuylkill rivers. The bird was in immature (juvenile) plumage, largely ashy gray, with a gray tail and black terminal band, almost a counterpart of the Laughing Gull (*L. atricilla*) in similar plumage except for the smaller

size and noticeably different bill. In these respects it exactly matched adult specimens of Franklin's Gull in the collection of the Academy of Natural Sciences of Philadelphia. Subsequently I compared it with young Franklin's Gulls in the collection of Dr. Jonathan Dwight, Jr., which showed at once that it belonged to that species. This is the first record of the bird for Pennsylvania and I believe the second for the Atlantic coast.—WITMER STONE, *Academy of Natural Sciences, Philadelphia, Pa.*

The Black-backed Gull (*Larus marinus*) on Long Island, N. Y., in August.—Near Jones Inlet, on August 14, 1910, I collected an adult female of this species. As this bird does not make its appearance on Long Island until the cold weather sets in, late in the fall, this early date appears to be a rare exception. The bird was moulting heavily, especially the primaries, so that it was unable to fly more than about 15 yards at a time. The fact that the specimen was moulting after having migrated instead of moulting before the migration period is quite unusual.—J. A. WEBER, *Palisades Park, N. J.*

***Phætusa magnirostris* Licht. in Cuba.**—On May 28, 1909, I secured an immature specimen of *Phætusa magnirostris* Licht. in the Laguna del Centeno, Nipe Bay, Oriente Province, Cuba. This is the first record for the species in Cuba, there being no doubt as to its identity, for it has been compared by Messrs. Frank M. Chapman and W. DeW. Miller at the American Museum of Natural History. This tern was the only one seen in the lagoon at the time.—CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

***Ixobrychus exilis* in Texas.**—On March 24, 1911, I received a Least Bittern (coll. H. K. C. No. 15026 ad. ♂) in the flesh from Capt. S. W. F. Hase, U. S. A., Fort Crockett, Texas, with the interesting information: "This morning while on a hike I ran across a flock of birds. One of them, apparently a young one, froze himself to the ground, stretching his long bill upward, and I had difficulty in seeing him among the yellow flowers. I placed my sabre across his feet, and picking him up, stuck him through the head."—HENRY K. COALE, *Highland Park, Ill.*

Egret in Northern New Jersey.—On August 7, 1911, as I was motoring past a meadow at Coleville, N. J., which is a small village situated five miles from Sussex, N. J., I saw an Egret. The altitude of Coleville is 800 feet. Three and a half miles distant is the highest point in the State, the height of which is 1809 feet. Coleville is four and a half miles from the New York and New Jersey state line, and six miles from the Delaware River.—JOHN DRYDEN KUSER, *Bernardsville, N. J.*

Yellow Rail (*Coturnicops noveboracensis*).—I recently examined a specimen of this somewhat obscurely known rail that was secured April 22, 1911, in Ecorse Township, Wayne County, Michigan. Mr. Arthur

Borek and a companion were gunning through a piece of tangled weedy low ground when the rail flushed from almost under their feet, and, by a lucky shot, was secured. The bird was mounted when I saw it and the sex is not known. This is the second recorded Michigan specimen, and the third noted in Wayne County, as a female was secured alive by a dog, and another flushed March 25, 1908 (see Taverner, *Auk*, 1908, p. 327).

I do not, however, consider that the species is as rare as these few records would seem to demonstrate, but that its skulking habits and the almost total inability to flush it render observation very unlikely. Here on Grosse Isle, a few miles below Detroit, I am positive that it occurs. Since May, 1907, I have heard, during April-June, notes that are so similar to those described for this species, which, taken together with the kind of marsh occupied, render it highly probable that the notes belong to a Yellow Rail. The territory in question is a wet low field, grown up with a coarse tangled mass of grasses, weeds, and sedges, similar to the kind of ground usually occupied by Henslow's Sparrows. Repeated attempts to flush the birds have failed but the services of a good dog would probably be more effective. The notes are somewhat similar to the effect produced by taking a small bottle in one hand, and tapping it lightly and slowly with a stone twice, with a short interval, repeated half a dozen times.

This species has been found in June in the low marshy territory at the mouth of the Thames River, Lake St. Clair, Ont., by Mr. W. E. Saunders. On this ground, on June 10, 1905, we heard notes which Saunders declared to be those of a Yellow Rail. We made several attempts to flush the bird by dashing quickly at the spot from different directions, but failed.—B. H. SWALES, *Grosse Isle, Mich.*

The Semipalmated Sandpiper in Philadelphia County, Pa.—On October 3, 1910, the writer examined three Semipalmated Sandpipers (*Ereunetes pusillus*) in the possession of a gunner, who shot the birds on the Delaware River meadows, at Bridesburg, Philadelphia County, Pa. One of these birds, a male, which is now in my collection, was generously given to me by the gunner, who, however, refused to part with the others, and what eventually became of them I do not know, but doubt if they were preserved.

This is the only authentic record of the occurrence of the Semipalmated Sandpiper in Philadelphia County, to my knowledge. There are, however, numerous unreliable records of birds *seen*, but this species so closely resemble the Least Sandpiper, with which it intimately associates, in coloration and habits, that it is practically impossible to distinguish between the two species in the field.—RICHARD F. MILLER, *Harrovgate, Philadelphia, Pa.*

The Golden Plover (*Charadrius dominicus dominicus*) on the Coast of South Carolina.—I shot on November 4, 1911, near Mount Pleasant, a fine adult male specimen of this now rare species, which was searching

for food in a recently ploughed field. This makes the third specimen I have seen in South Carolina since 1880, and the second that I have taken.

Although the bird had been wounded in one wing, which had not entirely healed, it was in excellent condition, being very fat. This specimen, like the one I took in December, 1880, was very wild.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Capture of a Golden Eagle at Kansas City, Mo.—On the morning of Oct. 31, 1911, at Seventieth Street and Broadway, Kansas City, Mo., there was captured by Owen Belford of Oklahoma City, and John Bower of Kansas City, Mo., a young Golden Eagle, measuring seven feet eight inches from the tip of one wing to the tip of the other. The men fired at several crows and struck the eagle, which was only stunned, and fell to the ground making the catch easy. The bird was on exhibition at police headquarters.—BENJ. F. BOLT, *Kansas City, Mo.*

Duck Hawk (*Falco peregrinus anatum*).—Mr. Arthur Borch, a Detroit taxidermist, received a fine nearly adult male Duck Hawk that was secured on July 15, 1911, in rather a novel manner. A lady was driving near Lake St. Clair, Grosse Pointe, when suddenly the hawk darted across a field, dived straight at her horse, and became entangled in the fly netting upon which he was killed with a whip. The Duck Hawk was probably in pursuit of some small bird that took refuge near the horse and which the lady failed to see. Wayne County records for this bird are not common, and this is my first summer record. On March 9, 1908, I watched one beating up the Detroit River near Grosse Isle. Two specimens were secured October 21, 1909, between Celeron Island and the mouth of the Huron River which I examined at the taxidermist's shop. On Lake Erie, near Point Pelee, however, we regularly see the bird in spring and fall.—B. H. SWALES, *Grosse Isle, Mich.*

Another Saw-whet Owl from Oregon.—To-day I had the pleasure of examining the skin of an adult female Saw-whet Owl (*Cryptoglaux acadica acadica*) shot by George D. Baker, a Portland taxidermist. The specimen was taken Oct. 12 of this year (1911) only seven miles from the coast near Gairdner, Douglas Co., Oregon. This is the sixth specimen taken by Mr. Baker near this locality during the past ten years.—STANLEY G. JEWETT, *Portland, Oregon.*

Occurrence of the Yellow-headed Blackbird on the Delaware River near Philadelphia, Pa.—According to Mr. Edwin C. Axe, the well-known taxidermist of Frankford, Philadelphia, Pa., there are two mounted specimens of the Yellow-headed Blackbird taken on the Delaware River marshes above the Pensauken Creek, in Burlington County, New Jersey, in collections in this city. Mr. Axe mounted the birds, which were

shot many years ago. and knows what he is talking about. One specimen was in the possession of the late Mr. Redmond, whose collection of birds I have been unable to locate, and the other bird is supposed to be in the collection of mounted birds now in the possession of a Mr. Bates of Bridesburg, Philadelphia.

The rarity of this species on the Delaware River is at once apparent when it is known to be an extremely rare straggler east of the Alleghenies. The only record of its occurrence in this region is of a bird shot in August, 1851, by John Krider on the marshes below Philadelphia, which is now in the Academy of Natural Sciences of Philadelphia. (Stone, *Birds of Eastern Pennsylvania and New Jersey*, p. 105.)

As I am hunting up data on the status of the Yellow-headed Blackbird in this locality, I may be able to report more fully upon the authenticity of these two occurrences of this rare bird at another time, this note being written principally to attract the attention of ornithologists to the occurrence of the above two birds, so as to secure if possible further information on these doubtful (?) records.—RICHARD F. MILLER, *Harrougate, Philadelphia, Pa.*

Xanthocephalus xanthocephalus in Eastern Cuba.—I beg to report that two specimens of the Yellow-headed Blackbird have been in the yard at San Carlos Estate, Guantanamo, Cuba, for two weeks, where they come daily with a band of *Ptilorina atrovirens* and *Agelaius assimilis*, to eat oats with the barn fowl. This is the first record for eastern Cuba according to Dr. Gundlach, who says in his work on Cuban Ornithology, that he knows only of one specimen, which was seen in the market at Havana, among birds that were shot for marketing.—CHARLES T. RAMSDEN, *Guantanamo, Cuba.*

Additional Records of the Evening Grosbeak in Pennsylvania.—I have recently purchased for my collection two mounted specimens of the Evening Grosbeak which were captured near La Anna, Pike Co., Pa., during the winter of 1889-90. The gentleman who had these specimens shot them from a flock of 15-20 and had them mounted. They remained in his possession until I saw them and, recognizing the rarity of the birds, secured them from him. They are a male and female in adult winter plumage and form desirable additions to the meagre list of captures recorded from this State.—RICHARD C. HARLOW, *State College, Pa.*

The Seaside Sparrow (*Passerherbulus maritimus maritimus*) Breeding on the Coast of Georgia near Savannah.—Mr. Gilbert R. Rossignol, Jr., of Savannah sent me four specimens of Seaside Sparrows for identification last summer and which were breeding on Cabbage Island, Warsaw Sound. I have compared these birds, which were taken in May, with specimens of *P. m. macgillivraii* from Charleston taken in autumn, winter, spring

(April), and late summer (July 25) birds, and they are all true *maritimus*, which is indeed an anomaly, as the form that breeds on the North Carolina coast east of Pamlico Sound is *P. m. macgillivrayi* (see Bishop, Proc. Linn. Soc. N. Y., Dec. 19, 1904, pp. 57, 58).

Although these specimens, taken in Warsaw Sound, have been identified by a well-known ornithologist as *Ammospiza maritima macgillivrayi*, they are without doubt representatives of *P. m. maritimus*.

A specimen of *macgillivrayi* taken by me on July 25, 1900, ♀ ad., although in very ragged plumage, must have been an exceedingly dark bird when in fresh plumage for the pileum and back are very deeply colored, and the mesial streak on the middle tail feathers is yet very wide despite the skeletonized condition of the tail.

I question whether Macgillivray's Sparrow breeds in Georgia or in Florida, for the birds taken there in the breeding season were in worn plumage and the characters which differentiate *maritimus* from *macgillivrayi* being obliterated the birds were assumed to be *macgillivrayi* on account of its more southern distribution. In view of the unique breeding range of *P. m. macgillivrayi* I should not be at all surprised if it is in reality a species, as its breeding range suggests *specific* difference. A female *macgillivrayi* in my collection taken by me on February 11, 1891, near Charleston, is as black on the upper parts as *P. nigrescens*.—ARTHUR T. WAYNE, Mount Pleasant, S. C.

The Bohemian Waxwing in Vermont in Summer.—It has been my good fortune to spend the time from August 7 to the 20th at Willoughby Lake this summer. Lake Willoughby, in the town of Westmore in northern Vermont, about 25 miles from the Canadian border, is a well known region to the botanists and ornithologists of New England. On the sandy beach at the south end of the lake, between Mt. Pisgah and Mt. Hor there are many birches; some are bare, dead trees, while other are well covered with leaves.

While at the beach August 18 a few Cedar Birds were about the trees, but on a dead tree, a Black-throated Green Warbler was looking over the branches, when what I first thought was a Cedar Bird flew to the same tree, and remained there a long time. As I looked at it, it seemed larger than a Cedar Bird; then I saw some white wing bars plainly. I watched it for twenty minutes or more, and when I left the beach it was still there.

Since then I have had a dead Cedar Bird in my hand to examine, and this bird at Willoughby was certainly larger, and the white wing bars (3 I think) were plainly to be seen. There was plenty of time to look at the bird, for it remained just where it perched at first as long as I watched it, and there were no leaves or branches to hide it.

I reported this incident to Dr. Walter Faxon of Cambridge, who is familiar with this region. I take the liberty to quote his reply: "I do not doubt that the bird you saw was the Bohemian Waxwing. The size and particularly the white wing-bars would distinguish it from the Cedar Bird."

—ANNA E. COBB, Providence, R. I.

Another Record of the Philadelphia Vireo from Long Island, N. Y.—On the morning of September 4, 1911, at Freeport, Long Island, I was "beating out" a tract of bushes on a salt marsh, in hope of seeing again a Migrant Shrike which I had flushed there the night before. The small growth fairly teemed with birds, but much to my disappointment the shrike was not to be found. When about to leave I noticed, feeding in the top of one of the taller bushes in company with some Red-eyes, a pair of small Vireos that I did not recognize. I collected one of the little fellows and great was my joy when unpacking the skin to find it to be a fine female specimen of the Philadelphia Vireo (*Vireosylva philadelphica*).

This bird, which is probably the fifth record from Long Island, and first since 1901, is in the collection of the Museum of the Brooklyn Institute.—HENRY THURSTON, *Brooklyn, N. Y.*

Bachman's Warbler in Camden Co. and Breeding in Chatham Co., Georgia.—Under the above title Mr. Isaac F. Arnow records in 'The Auk,' Vol. XXV, October, 1908, p. 479, Bachman's Warbler (*Vermivora bachmani*) breeding at Savannah. These eggs, three in number, were found by Mr. Gilbert R. Rossignol, Jr., who, however, was extremely doubtful as to their identity, as he saw no bird.

Mr. Rossignol sent me the eggs for positive determination and, upon their reception, one glance was sufficient to disprove Mr. Arnow's identification, for they are unmistakably and unquestionably eggs of Swainson's Warbler (*Helinaia swainsoni*). I, however, compared them critically with two sets of *Vermivora bachmani* representing extremes—largest and smallest—that were in my collection, and which I took near Charleston, and the difference was appreciable at a glance. Mr. Arnow says that the eggs of Swainson's Warbler are without gloss. The fact is the eggs are often very glossy. Mr. Rossignol had nothing whatever to do with the identification of the supposed eggs of Bachman's Warbler, as he was merely the owner, and I may add that my identification is free from bias.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Dendroica aestiva Captured by a Spider.—In the early part of September my friend, Otto Helwig, while crossing a piece of brush land on the edge of town, flushed a Yellow Warbler, which flew against a big spider-web stretched across a bush, and became entangled with wings spread out against the web. As the bird struggled to free itself, the spider (a large black one with yellow markings) ran down the web and at once began to bind its victim, by running back and forth across its body and wings and weaving its silken strands from side to side, completely tying the bird to the web. At this point Mr. Helwig stepped up, the spider dropped into the bush, the bird was released, soon revived and flew off.—HENRY K. COALE, *Highland Park, Ill.*

The Louisiana Water-Thrush and Broad-winged Hawk in Southern New Jersey.—In Mr. Stone's recent work on New Jersey birds the

general impression is given that the Broad-winged Hawk is a very rare summer resident of southern New Jersey, while it is said that the Louisiana Water-Thrush is entirely absent, or at least no records of it have been secured. It is with the idea of giving additional information on this subject that I record the following.

I have several records of the Broad-winged Hawk in summer from Clementon, Dennisville, and Bennetts, and on May 27, 1908, saw a pair at Ludlam Lake near Dennisville which had a nest nearby, judging from their actions.

The Louisiana Water-Thrush is undoubtedly a rare summer resident but nevertheless in three successive trips near Bennetts, Cape County, I have found one or two pairs each time during the breeding season, and David Harrower has also observed them in this vicinity. This information is given solely with the object of increasing the records extant of the birds in this locality.— RICHARD C. HARLOW, *State College, Pa.*

Western Records of the Catbird (*Dumetella carolinensis*).— A recent note in 'The Auk' on a Catbird taken at Nampa, Idaho, reminded me of a specimen in my collection taken at Sparta, Oregon, August 11, 1906, where several were seen at the time. This is the farthest west I have ever seen the species but I have found them common all over the Snake River valley from Nampa, Idaho, east to Pocatello, Idaho, and north of Boisé in the foothills where they breed in considerable numbers.— STANLEY G. JEWETT, *Portland, Oregon.*

An unusually late Nesting Date of the Catbird (*Dumetella carolinensis*).— On August 20, 1911, I flushed a Catbird from her nest near Fort Lee, N. J. The nest contained two newly hatched young and one egg. Believing this to be an unusually late nesting date I thought it worthy of record.— J. A. WEBER, *Palisades Park, N. J.*

Capture of the Carolina Wren at Portland, Maine.— It is my wish to place on record the taking of a Carolina Wren (*Thryothorus ludovicianus*) on November 3, 1911, since it is, I believe, but the second of its kind ever seen in this vicinity. The bird flew into my sunroom where I secured it by casting a light cloth over it, and placed it in a canary cage swathed about with mosquito netting to prevent its fighting the bars. The bird was active, seemed in good condition, and, with the coming of night, slept serenely; but it died unexpectedly in the morning when I was out of the room. It had taken a little mockingbird food and a little soaked cracker, but showed no liking for either. Mr. Arthur H. Norton, who prepared the bird's skin for the Natural History Museum, states that it was an old female and died apparently from natural causes.

I find that my neighbor had watched this bird in her garden the day before its fatal visit to my house. Bowdoin Street is on the southwestern

edge of Portland where grassy fields, wet thicket, the steep wooded slope of the Western Promenade, old gardens, and a sunny old burying ground make admirably diversified territory for birds, bringing us into the midst of spring and fall migrations.

The other Carolina Wren, a male, was discovered some time in August, 1908, at Falmouth, Maine, by Mrs. Ernest Brewer, who observed it throughout the remainder of the summer, until October 3 when Mr. Norton shot it for the Portland Society of Natural History, at whose museum the skins of both these wrens are now kept.

Records of Mrs. Brewer's Carolina Wren are to be found in 'The Auk,' XXVI, p. 82; and in an article by her in the Journal of the Maine Ornithological Society, XI, pp. 4-10.—CAROLINE M. STEVENS, *Portland, Me.*

Carolina Wren (*Thryothorus ludovicianus ludovicianus*).—On January 16, 1911, I heard the familiar notes of a Carolina Wren coming from the rear of my home on Grosse Isle, and I soon detected him perched on my vine-clad ice house, scolding and singing pretty constantly. It was a sharp clear day (11° F.), and the bird was still present when I left for Detroit at 3 p. m. This was the first Carolina Wren that I had seen or heard of on Grosse Isle. During the summer a Mrs. Donaldson told me that a pair had bred on Hickory Island immediately connecting Grosse Isle on the south, but this I have not been able to verify to date. On September 3, 1911, I noticed a Wren singing gayly from the top of a shed near my place, and this bird remained around for several days, generally frequenting an old chicken shed. I am entertaining hopes that a pair may return here next spring. P. A. Taverner secured a female May 16, 1909, near Rockwood, a few miles further down the river. These instances seem to indicate, together with the Detroit records, that the Carolina Wren is gradually working up into southeastern Michigan as it has in Essex County, Ontario. Here on June 6, 1909, about three miles below Amherstburg, W. E. Saunders heard one singing, and another about three miles from the base of Point Pelee where it is common, and resident. On October 6, 1909, Mr. Jas. S. Wallace saw one on the roof of the Manning House, Windsor, directly across the river from Detroit. North of Detroit there is a mounted specimen in Mr. Samuel Spicer's collection taken at Goodrich, Genesee County, a number of years ago in spring.—B. H. SWALES, *Grosse Isle, Mich.*

Waterfowl Nearly Drowned.—In the Aviary building of the Chicago Lincoln Park Zoo is a cage about 40 × 15 feet enclosing an island, surrounded by water—which is the home of over 200 wild Ducks, Geese, Swans, Pelicans and other birds from different countries, representing 60 different species. Mr. Ryan, the assistant keeper, told me of a singular mishap, through which the water birds nearly lost their lives by drowning. The pond is 30 inches deep, and once a month the water is run out,

and fresh water supplied from Lake Michigan, on which occasion all the waterfowl have great sport in the clean, fresh water. Last February the new system of supply was forced by suction through a screen, by a very powerful steam pump. After the pond was filled it was noticed that the water was thick and oily and instead of "running off the duck's back" as usual, soaked right into his feathers. In a few minutes the birds became literally water-logged, and were floundering around, unable to keep on top of the water, and too weak to crawl up on the island. Boards were floated on the surface, on to which some of the birds climbed, while the water was being run off, which took about an hour. It was found that the bottom of the pond was covered to a depth of several inches with a thick pulp of pulverized fish, which had been ground up by being sucked through the fine screen. Several wagon loads were removed, and it took a long time to clean the pond and the birds which were soaked with the oily moisture.— HENRY K. COALE, *Highland Park, Ill.*

Shore-bird Notes.— Last September, Wilson's Phalarope appears to have been not uncommon along the Atlantic Coast. I have never seen this species before, although I shot a Northern Phalarope at Quogue, L. I., during the month of August, 1907. I have the following records of the occurrence of Wilson's Phalarope. Adult female shot by Mr. Whitlock at Quogue on September 4. Immature in winter plumage were shot near Currituck Light House, North Carolina, by Mr. Whitlock and Mr. Nourse on September 7, September 8 (two), and September 12. A well-marked female was seen by me September 14. This bird was so tame that it allowed me almost to touch it before it flew away in a zigzag manner. An old gunner at Currituck had never seen these birds before.

The Buff-breasted Sandpiper seems also to have been unusually common along the coast. Mr. Whitlock shot a specimen at Quogue, L. I., on September 4, and three at Currituck on September 12. I saw a flock of six at the same place on September 14. This species was also unknown to the local gunners.

On September 11, at Currituck, I shot a Solitary Sandpiper on a sandy beach. I have frequently seen this bird in woodland streams but never near salt water.

On September 12, two Marbled Godwits were shot by Mr. Whitlock and myself at Currituck. The female was the smaller, measuring 17.00 and the male 19.25. The absence of bars on the underparts would indicate that they were young birds.

I trust these records may be of interest, both as individual records and also as showing the tendency of certain western Shore-birds to follow the same line of migration to the shores of North Carolina as is later followed in far greater numbers by the Canvas-back, the Mallard, and the Whistling Swan.— FREDERICK WM. KOBBE, *New York City.*

Two Interesting Captures in Lincoln Park, Chicago.—On June 12, 1911, Officer C. W. Borggren of Lincoln Park, Chicago, came into my office with a fine specimen of *Cyanocitta stelleri diademata* which he had just shot. The bird was in perfect plumage, with no fraying of the tail or primaries, characteristic of a bird that has been caged. He said that his attention had been called to the bird by the cries of a large number of birds nesting in the park, and he found that the jay had taken all of the young from the nest of a Yellow Warbler, had eaten the heads and dropped the bodies to the ground, and was about to repeat the operation on a nest of young Robins. He shot the bird, which is now in the Museum of the Chicago Academy of Sciences, Lincoln Park.

On September 19, Mr. P. W. Boehm, of Ravinia Park, Illinois, brought in a specimen of the Duck Hawk in the juvenile plumage. The bird had flown into his chicken yard, and had killed and was attempting to carry away a three and one-half pound chicken.

Mr. Kahman, a Chicago taxidermist, reported that on the 21st of September, an Italian had brought him two young female Duck Hawks which, he said, had flown into his yard on the west side of the city, and had killed several of his pigeons. They were so bold that he had no difficulty in killing both of the birds.—FRANK M. WOODRUFF, *Chicago Academy of Sciences, Chicago, Ill.*

Two New Birds for Greenland.—In examining literature relating to the ornithology of Greenland I have found the following recent references to two birds that to my knowledge have not as yet been recorded from that country. These are:

Turdus iliacus Linn. (Petersen, Johan, 'Ornith. Iaktt. fra Angmagsalik i Aarene 1902-08, bearbejdede og sammenstillede af O. Helms,' Dansk Ornith. Foren. Tidsskrift, 3 Aargang, Hæfte 1, Copenhagen, Dec., 1908). In translation the reference reads as follows: "To-day [Oct. 20, 1904], 'Kateketen,' [probably some kind of a pedagogue], and myself each shot one specimen here at the station [Angmagsalik, east coast of Greenland]; they flew from one icefloe to another, near the shore, looking for food. Occasionally they made a little trip inshore, where they no doubt secured sandhoppers and small slugs; they were not very shy." And again, October 31, 1906: "I received to-day a 'Vindrossel' [Danish name for the Redwing] from a Greenlander, who had shot it on the shore." November 3, same year: "A Greenlander saw a strange bird in the course of the day, which he supposed to be a 'Vindrossel.'" Three birds were shot and their skins forwarded to the Museum at Copenhagen. Helms states that this is the first record of *Turdus iliacus* from the east coast of Greenland, while there have been "a couple of mentions from the west coast." These mentions are probably the following: (Winge, Herluf, 'Grønlands Fugle,' Medd. om Grønland, Heft 21, Copenhagen, 1899. p. 283): "The Redwing has been seen a couple of times on the west coast of Greenland.

Paulsen received one in 1845 from Greenland. One was shot at Frederikshaab on the 28th (not the 20th) of October, 1845, and sent to Copenhagen Museum by Holboell." As is well known, the Redwing is a Eurasian species, common and breeding throughout Iceland, northern Scandinavia, Finland, northern Russia and Siberia as far east as Lake Baikal. It is a common winter visitor in the British Islands, and has also been found on Jan Mayen Land.

Totanus totanus (L.), or *Scolopax calidris* of Linnæus (Helms, O., 'Nye arter for Ostgrønland,' Dansk Ornith. Foren. Tidsskrift, 4. Aargang, Hæfte IV, Copenhagen, October, 1910). This is what Helms has to say on the subject (p. 131): "Petersen received a specimen of the 'Rødben' (*Totanus calidris*) from a boy who had shot it at Kilitorajivit on Angmagssalik Fjord. This is practically the first occurrence of the Redshank recorded for Greenland; the bird probably came from Iceland, where it breeds in great abundance."—The Redshank also is of Eurasian origin, its range extending from Iceland to China.—S. M. GRONBERGER, *Smithsonian Institution, Washington, D. C.*

Additions to a List of the Birds of Harding County, Northwestern South Dakota.—In 'The Auk' for January, 1911, pages 5-16, I gave a partial list of the birds of this county. It can be somewhat supplemented now. Mr. A. A. Saunders, of the Forest Reserve, spent portions of November and December, 1909, in this region and observed six species not mentioned in the list. Mr. Saunders has kindly permitted me to announce these records. I spent from June 6 to 20, 1911, in this county under the auspices of the State Survey and revisited the greater part of the county. Due to the unusual severity of the drough, birding was poor and only four species were added to the published list. The ten new species are marked with an asterisk.

***Mergus americanus*.** AMERICAN MERGANSER.—Taken August 10, 1910, in Harding Valley by a resident.

***Astur atricapillus atricapillus*.** GOSHAWK.—One seen by Mr. Saunders near Harding, November 7.

***Asio flammeus*.** SHORT-EARED OWL.—Found nesting in 1911 east of the Slim Buttes.

****Nyctea nyctea*.** SNOWY OWL.—Several seen north of Camp Crook, December 14 by Mr. Saunders.

***Cyanocephalus cyanocephalus*.** PISON JAY.—While in 1910 we found these birds only in the Cave Hills, they were found in all of the forested buttes in 1911. The old timers say that they are new arrivals.

***Molothrus ater ater*.** COWBIRD.—While in 1910 I saw not more than a score of individuals, in 1911 they were frequently observed and were quite numerous.

****Quiscalus quiscula seneus*.** BRONZED GRACKLE.—Several nested near Reva in the Slim Buttes in 1911.

**Acanthis linaria* (*linaria*?). REDPOLL.— Mr. Saunders reports having seen a small flock of Redpolls in West Short Pine Hills on November 6.

**Plectrophenax nivalis nivalis*. SNOW BUNTING.— Flocks were seen by Mr. Saunders during the last half of November and the first half of December, the time that he spent in this region.

**Calcarius lapponicus lapponicus*. LAPLAND LONGSPUR.— Reported by Saunders to have been abundant during his stays.

**Spizella monticola ochracea*. WESTERN TREE SPARROW.— Common in the Short Pine Hills in December (Saunders).

**Passerina cyanea*. INDIGO BUNTING.— One seen in Slim Buttes, June 12, 1911.

Piranga ludoviciana. WESTERN TANAGER.— One of the most conspicuous of the birds in the Short and Long Pine Hills at the middle of June. Two nests found.

Bombycilla garrula. BOHEMIAN WAXWING.— Reported by several to have been in 1910–1911 one of the most numerous of the winter birds of the pines.

Seiurus aurocapillus. OVENBIRD.— Nested abundantly in the Short Pines in 1911.

**Setophaga ruticilla*. REDSTART.— Several pairs nested in the Slim Buttes in 1911.

**Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH.— Seen November 8 in the East Short Pine Hills by Mr. Saunders.

**Planesticus migratorius propinquus*. WESTERN ROBIN.— More abundant in 1911 in the pines than was the Eastern Robin.— STEPHEN SARGENT VISHER, *Vermillion, S. D.*

Notes from West Virginia. *Empidonax trailli alnorum*.— From August 5 to 11, 1909, I spent several days with a collecting party in the Cranberry Glades, Pocahontas County, West Virginia. Many northern species of plants, mammals, and birds were found there. Among these were Alder Flycatchers in considerable numbers. Three specimens were taken, all of which were young birds. One of these young birds was fed by an adult just a moment before it was shot. Very frequently during my stay in this region one or two adults accompanied by three or four young were seen. They were most common in the alder thickets about the edges of the glades.

Peuceea aestivalis bachmani.— My first record of the occurrence of Bachman's Sparrow in West Virginia was made in Wood County in late summer, 1903. Since then it has become quite common in the central and northern parts of the State. Many were observed at Waverly, Wood County, from 1903 to 1907. In certain old fields, near the edge of the woods, the males might be heard in song almost any day from April 25, when they first appeared, till midsummer, when the song period seemed to cease. More recent records have been made as follows:—

Morgantown, observed in spring and summer, 1909–1911.

Weston, quite common for past four years.

French Creek, quite common in spring and summer during the past five years. At least four pairs seem to have nested on a little farm of about one hundred acres during the summer of 1910. The sweet song of this bird might be heard coming from many directions on any morning in spring or early summer. On May 1, 1911, a male was taken at French Creek. It was singing when shot, and had been singing near the same place for about two hours. This specimen was identified by W. E. Clyde Todd of the Carnegie Museum, Pittsburgh, and the skin is now in my possession.

Melospiza georgiana.—Quite common in the Cranberry Glades, Pocahontas County, in August, 1909. Old birds were observed with young just from the nest.—EARLE A. BROOKS, *Weston, W. Va.*

New Records from Arkansas.—During December of 1910 Mr. Logan Evans of Wilsey, Kansas, spent a few days in Mena, Arkansas, and while there collected and made up a small series of bird skins. The species represented are mainly those commonly found in that region in winter but I note one specimen of *Spinus p. pinus*, a female taken December 21, 1910, which is apparently the first record of this bird for the State, though it is undoubtedly a more or less irregular winter visitant. (cf. Howell, *Birds of Arkansas*, Bull. Biological Survey, No. 38, p. 61.) Other records of interest are a pair of *Dryobates borealis*, the female taken December 23 and the male December 26, 1910. These are to my knowledge the first noted from this locality.—ALEX WETMORE, *Biological Survey, Washington, D. C.*

Notes from the Magdalen Islands.—**Spatula clypeata.** SHOVELLER.—One shot at Grindstone Island by a native during the first week of September, 1906. It was examined by Mr. Stanley Cobb and myself but decomposition was too advanced to save the skin.

Limosa hæmastica. HUDSONIAN GODWIT.—On September 11, 1908, I took a female of this species on the North Beach (between Grindstone Island and Grosse Isle). The skin is in my collection. I have seen no others of this species during three trips to the Magdalen Islands.

Tringites subruficollis. BUFF-BREASTED SANDPIPER.—A male of this species was secured on September 13, 1908, by my companion Mr. J. R. Gilman, on the North Beach.

Micropalama himantopus. STILT SANDPIPER.—On September 24, 1908, a single Stilt Sandpiper lit within a few feet of the blind I was occupying while shooting shorebirds on Grindstone Island. I had an excellent opportunity to observe the bird but unfortunately failed to secure it. I am positive that this bird was *Micropalama himantopus*, for I was close enough to observe its most striking characteristics. This is the latest date for the latitude that I am able to find.—WINTHROP S. BROOKS, *Milton, Mass.*

Bird Enemies of the Chinese Cotton Scale.— For several years our shade trees, especially maples and black locust, ornamental shrubs and vines, have been threatened with destruction by the invasion of the Chinese cotton scale. I have kept close watch over the pest to see if it had any bird enemies, and not until last winter was I able to satisfy myself that there were birds which sought the scale for food. A flock of twenty-five Redpolls (*Acanthis linaria*) passed the winter months in the city, and came almost daily to the maple trees about my home and fed upon the cotton scale. Their peculiar action in reaching around beneath the branches of the trees whilst feeding first attracted my attention, and with the aid of my field glasses I was able to determine their kind and what they were feeding upon.

Frequently a number of Pine Finches would associate with the Redpolls and partake of the same insect food. It is claimed by some observers that the Western Evening Grosbeak (*Coccothraustes vespertinus montanus*), feeds upon the Chinese scale, but I am inclined to doubt this assertion, from the observation I constantly had over a large flock of over one hundred which spent the winter in this city, and upon no occasion did I notice them feeding upon the scale. A friend told me he had observed the Chickadees feeding on the Chinese cotton scale and I trust that he was not deceived.

This season, for the first time, the city authorities have systematically sprayed all our shade trees with some chemical which has pretty thoroughly annihilated the scale pest, so the opportunity for study along this line will not be so favorable this winter. — W. W. ARNOLD, *Colorado Springs, Colo.*

RECENT LITERATURE.

McAtee's 'Woodpeckers in Relation to Trees and Wood Products.'

— In this valuable and interesting publication¹ Mr. McAtee treats exhaustively a subject upon which there has been much need of authentic information. First is considered the damage done by Woodpeckers in general, to trees, telegraph poles and buildings, in excavating for nests — damage which can usually be prevented by furnishing artificial nest boxes and which rarely or never calls for the destruction of the birds. Furthermore the benefit conferred by Woodpeckers, exclusive of the Sapsuckers, in destroying insects, far more than compensates for the damage they do. With the Sapsuckers however, the case is different, and the bulk of Mr. McAtee's report is taken up with a discussion of the depredations of the Yellow-bellied and Red-breasted Sapsuckers (*Sphyrapicus varius* and *ruber*) and their geographic races. The evidence presented seems fully to warrant the author's conclusion, that these birds should be included in the class of injurious species and destroyed whenever caught redhanded. The status of Williamson's Sapsucker (*S. thyroideus*) is still in doubt owing to lack of information. The various species of trees and vines attacked by the Sapsuckers are listed systematically with comments on the character and extent of the damage inflicted, and with numerous excellent illustrations.

In puncturing the bark to reach the sap the birds injure the cambium layer, causing irregularities of growth and distortion of the grain of the wood. Furthermore the punctures admit moisture, bacteria, fungi, etc., which produce stains or decay, rendering the lumber valueless for ornamental or other special uses and sometimes causing the death of the tree.

The annual loss resulting from the Sapsucker's attacks in the United States exceeds a quarter of a million dollars. Mr. McAtee accompanies his condemnation of the Sapsuckers with a word of warning to the effect that "great care should be exercised to distinguish the real offenders, as there are twenty species of Woodpeckers in the United States and only two are under indictment."

Two excellent colored plates by Fuertes illustrate the several species of Sapsuckers, and add to the value and attractiveness of this excellent bulletin.— W. S.

Forbush on the Starling in America.²— In June, 1910, through the coöperation of the Bureau of Biological Survey, U. S. Department of Agri-

¹ Woodpeckers in Relation to Trees and Wood Products. By W. L. McAtee. Bulletin No. 39. Biological Survey, U. S. Department of Agriculture. Issued September 26, 1911.

² Annual Report of the State Ornithologist for the year 1910. Massachusetts State Board of Agriculture. July 11, 1911.

culture, Mr. E. H. Forbush was able to visit the several States in which the Starling has become established, and by personal investigation as well as by correspondence, to secure much historic and economic information concerning the bird, which is here presented. The first successful introduction of the Starling in America seems to have been in 1890, when Eugene Schieffelin liberated 120 birds in Central Park, New York City. The species has now spread over Long Island, New Jersey, Connecticut, and eastern Pennsylvania, although still most abundant in the vicinity of New York; while it has been reported from Odessa, Del.; Springfield, Mass.; Rhinebeck, N. Y., and Millersville, Pa.

As to the relation of the Starling to our native birds Mr. Forbush finds that it drives away such birds as Flickers, Bluebirds and House Wrens, by occupying their nesting places, while it competes actively with our birds for their food supply. In winter especially the flocks of Starlings scour the country so thoroughly, that they must devour most of the supply of food upon which our winter birds are accustomed to subsist. Furthermore, as Mr. Forbush says, "the Starling can give no service that cannot be equally well performed by our own Blackbirds, Meadowlarks, Bobolinks, Sparrows and other birds," while it has already "begun to show a capacity for harmfulness which may be expected to become more prominent as its numbers increase." Accounts of the great damage inflicted upon berry patches and vineyards in Europe, give us some idea of what we may expect from the unfortunate introduction of this undesirable bird.—W. S.

Strong on the Olfactory Organs and the Sense of Smell in Birds.¹

—Dr. Strong's investigations here presented were of two kinds, morphological and experimental. The former consisted of the study and dissection of the heads of sixty-five species representing twenty-seven of the thirty-five orders of existing birds; the material being for the most part that contained in the Senckenbergisches Neurologisches Institute at Frankfort-am-Main, Germany, where every facility was extended to the author by the director, Prof. Ludwig Edinger.

These studies gave evidence that (1) the olfactory organs of birds are of too great size to be set aside as non-functional, but that (2) there is a tendency in the bird series toward retrogression in these organs. In the Emu and Fulmar the olfactory lobes were found to be of relatively great size while in the Corvidæ they are surprisingly minute.

Dr. Strong's experimental work consisted mainly of experiments upon Ring Doves in a covered enclosure with four similar accessory chambers communicating with it. These were so constructed that food placed in them was not visible from the main chamber, and by aid of glass tubes and suitable apparatus air currents could be created from any of the accessory chambers which could be charged with odors as desired.

¹ On the Olfactory Organs and the Sense of Smell in Birds. By R. M. Strong. From the Hull Zoological Laboratory, University of Chicago. *Journal of Morphology*, XX, No. 3, September, 1911, pp. 619-658, pl. I-II and figs. a-d.

The birds were first trained to search for food indiscriminately in the various chambers, and then developing an odor in the chamber containing the food record was kept as to whether or not the bird entered this chamber in preference to any of the others. The experiments were repeated a number of times and with different odorous materials. Although the birds never learned to find their food with perfect accuracy, it was evident that they were guided to some extent by at least one of the materials used; the percentage of correct entrances being notably larger than would have been expected according to the law of error.

Dr. Strong concludes that birds have a sense of smell, which in some species at least is more acute than in man. He agrees with Turner that the development of keen vision in birds is being accompanied by a degeneration of the olfactory sense, and further suggests that a mutual relation between the olfactory and visual senses may exist, which makes it very difficult for a bird to react to an olfactory stimulus only.

The literature of the subject is considered but in the case of published field observations the author says the chances of error in interpretation are so great that they have little value.

Dr. Strong has made a welcome contribution to a much mooted question, and has started a line of investigation which may be followed with profit by others. With a clear understanding of the difficulties as set forth by him and a constant check on unwarranted inference, it would seem that field observations of real value should be possible.—W. S.

Lowe's 'A Naturalist on Desert Islands.'¹—The author here presents an account of visits to some of the remote and unfamiliar islands of the Caribbean Sea—Swan Island, Blanquilla and The Hermanos. The physical features of the islands, their inhabitants, their geological history and the origin of their fauna and flora are treated entertainingly along with the narrative of the voyage, making an interesting and readable volume. The ornithological results of the cruise have already been published elsewhere, but many observations on bird-life are given here in a more popular and detailed manner. Among the illustrations are photographs of Boobies and Frigate Birds and several maps.—W. S.

Lechner's 'Oologia Neerlandica.'²—Part I of this work,² which was announced in the July Auk, is now at hand. It comprises text for sixty-

¹ A Naturalist | on Desert Islands | By | Percy R. Lowe, B. A., M. B. (Cantab.) | Member of the British Ornithologists' Union | With thirty-two plates and three maps | Witherby & Co. | 326 High Holborn, London | 1911—Svo, pp. xii + 300, 7s. 6d. net.

² Oologia Neerlandica | Eggs | of | Birds | Breeding in the Netherlands | By | A. A. Van Pelt Lechner | Member of the Board of the "Nederlandsche Ornithologische Vereeniging" | (Netherlands Ornithological Society) | With colored plates made direct from specimens | in the author's collection | vignette | The Hague | Martinus Nijhoff | 1911. Small 4°. 250 copies printed of which 100 are in English. Part I, (Sept., 1911) comprises Plates 1-10, 12, 13, 15, 16, 20, 23, 25, 27-29, 33-35, 37, 39-44, 46, 47, 76, 83, 84. Price £1.10 net.

two species and thirty-five plates, the text sheets and plates being unbound in a folder. The work is beautifully prepared, the text handsomely printed on handmade paper, the illustrations admirable color plates, each figure being mounted separately on heavy paper, three to six on a plate.

Under each family the eggs of the several species are discussed with regard to their resemblances and systematic relationship, as well as their variation in color and form; while much interesting information regarding the depth of deposit of the pigment in the shell, and the composition of the pigments, is presented. Following this is a page for each species, intended to face the plate when bound, upon which is given the "Colour of shell, colour of spots, average dimensions, average weight of shell, texture of shell, shape, nest, site of nest, number of eggs, breeding season, and duration of incubation." As a purely "oölogical" work it is one of the best that has appeared and could be studied with profit by those who desire to place egg collecting on the plane of a science instead of allowing it to become a mere fad as has too often been its fate in America.—W. S.

Berlepsch on Birds of the Aru Islands.¹—This paper, while based primarily upon a collection made by Dr. Hugo Merton from January to May, 1908, is extended to include all species hitherto reported from the islands. References to place of publication, type locality, and published records for each species are given, which form a valuable summary of our knowledge of the birds of this interesting group. A table is appended showing the distribution of the species or related geographic races in New Guinea and other neighboring islands.—W. S.

Riley on Three New Birds from Canada.²—In identifying a collection of birds taken on the 1911 Expedition of the Alpine Club of Canada to Jasper Park, Yellowhead Pass, and the Mount Robson region of British Columbia and Alberta, Mr. Riley finds three races which he regards as separable. A Song Sparrow, *Melospiza melodia inexpectata*, is intermediate between *M. m. rufina* and *M. m. merrilli*, apparently a case of very close splitting since the last form has been recently regarded as merely an intermediate between *rufina* and *montana*. A Fox Sparrow, *Passerella iliaca altivagans*, is based upon "two slightly immature birds from Moose Branch of the Smoky River" and some migrants from farther south. Mr. Riley's studies of the Willow Ptarmigan lead him to recognize three forms in North America, *Lagopus lagopus alexandræ* Grinnell from the southwestern coast of Alaska, *L. l. albus* Gmelin from Hudson Bay to Siberia, and a form from Ungava which he names *L. l. ungavus*.—W. S.

¹ Die Vögel der Aru-Inseln mit besonderer Berücksichtigung der Sammlungen des Herrn Dr. H. Merton. Von Hans Graf von Berlepsch. Abhandl. der Sencenbergischen Naturforschenden Gesellschaft, Bd. XXXIV, 1911.

² Descriptions of three New Birds from Canada. By J. H. Riley. Proc. Biol. Soc. of Washington, XXIV, pp. 233-235. Nov. 28, 1911.

Kellogg on Winter Birds from Trinity and Shasta Counties, California.¹—Miss Kellogg accompanied Miss Alexander on a February collecting trip into the mountains of Trinity County in the interests of the Museum of Vertebrate Zoölogy of the University of California, and in this paper presents field notes upon the thirty-eight species observed. Flocks of Bohemian Waxwings were encountered at Tower House and Helena, while Song Sparrows collected at the former station indicate, according to Miss Kellogg, that the race *Melospiza melodia morphna* is identical with *rufina*; while "there is intergradation between *montana* and *rufina*, the name *merrilli* having been applied to some such intergradient form."—W. S.

Wood on Birds of the Charity Islands, Michigan.²—Mr. Wood had charge of the vertebrate zoölogy on an expedition to the Charity Islands, Lake Huron, in the interests of the University of Michigan; which was made possible by the generosity of Hon. W. B. Mershon. The present paper gives an annotated list of the birds observed. Notes on 162 species are included, but as field work did not begin until August 16, satisfactory data upon the breeding species was not obtained and the annotations relate largely to the fall migration.—W. S.

Swarth on a New Hairy Woodpecker from Southeastern Alaska.³—Mr. Oberholser's recent revision of the Hairy Woodpeckers does not seem to have exhausted the possible races of this bird, in spite of the abundant material at his command. A series of skins from "the islands of the Alexander Archipelago and a narrow strip of mainland coast lying west of the coast range and south of the Taku River," represent, according to Mr. Swarth, a race differing from both *Dryobates villosus picoideus* and *D. v. harrisii*, which he names *D. v. silkensis*.—W. S.

Report of the Meriden Bird Club.⁴—This attractive brochure is well calculated to arouse interest in practical protection and study of wild birds, and illustrates what a local Bird Club, or branch of the Audubon Society, may accomplish under efficient direction. Various methods of attracting birds by establishing feeding places, shelters, bird boxes, etc., are considered and illustrated, as well as the history and activities of the Club.—W. S.

¹ A Collection of Winter Birds from Trinity and Shasta Counties, California. The Condor, XIII, pp. 118-121, July, 1911.

² The Results of the Mershon Expedition to the Charity Islands, Lake Huron. Birds. By N. A. Wood. Wilson Bulletin, July, 1911, pp. 78-112, with map.

³ Description of a new Hairy Woodpecker from southeastern Alaska. By H. S. Swarth. University of California Publications in Zoölogy, Vol. 7, No. 9, pp. 313-318. Published October 9, 1911.

⁴ First Report of the Meriden Bird Club, 1911. Boston, Mass. [published by the Club, Meriden, N. H.] 8vo., pp. 67. 18 half-tone plates.

Cooke on the Distribution of the American Egrets.¹— This circular consists of two maps showing by actual records the original distribution of the Egret, *Herodias egretta*, and the Snowy Egret, *Egretta candidissima*, with brief remarks upon their past and present range. "Fortunately," says Prof. Cooke, "in the case of each of these species, breeding colonies still remain in the southern United States to serve as centers of distribution to the districts formerly included in the range." So long however as States like Pennsylvania afford these birds no protection, and the pot hunter shoots at every "white crane" that strays north of the present limited breeding range, the outlook for the extension of this range to its former limits is discouraging.— W. S.

Fleming on a New Teal from the Andaman Islands.²— Mr. Fleming finds that six specimens of *Polionetta* recently received from North Reef Island, west of North Andaman, differ constantly from specimens of *P. albigularis* from South Andaman, and he proposes to separate them as *P. a. leucopareus*.— W. S.

Rubow's 'Life of the Common Gull.'³— This is an English translation of the original Danish edition already reviewed in these pages, with the same excellent series of illustrations.— W. S.

Gentry's 'Life-Histories'— A Belated Review.⁴— These volumes were not adequately reviewed when first issued, nor since, so far as the writer is aware. As if by common consent they have been very consistently ignored by American ornithologists. Although the writer believes that untrustworthiness in supposedly scientific work should be fully exposed, he has up to the present acquiesced in the silent treatment of Gentry's volumes. Now, after a lapse of more than 30 years, comes a case which shows how necessary it is for those to point out errors who are enabled to do so by familiarity with the subject or the man. It would not be necessary to discuss the character of a work so generally consigned to oblivion, were it not for the fact that it now seems to be taken seriously abroad. Mr. G. A. K. Marshall, in presenting a collection of the records of birds attacking butterflies (in Trans. Ent. Soc. Lond., 1909, pp. 326-383) quotes freely

¹ Distribution of the American Egrets. By W. W. Cooke. Circular 84. Bureau of Biological Survey, U. S. Department of Agriculture. Issued September 13, 1911. pp. 5.

² A New Teal from the Andaman Islands. By J. H. Fleming. Proc. Biol. Soc. of Washington, XXIV, pp. 215-216, Oct. 31, 1911.

³ The Life of the Common Gull told in Photographs. By C. Rubow. Translated from the Danish. Witherby & Co. 326 High Holborn, London, W. C. 1911—8vo. [pp. 6], 25 illustrations from photographs from life.

⁴ Gentry, Thos. G. Life-Histories of the birds of eastern Pennsylvania, Vol. I, 399 pp. Published by the author, Philadelphia, 1876. Vol. II, 336 pp. Salem, Mass., 1877.

from Gentry's 'Life-histories,' he of course taking them for bona fide and reliable records, which they are not. A majority of Mr. Marshall's records for North America come from these books.

The writer is not the first to take exception to the quality of Gentry's works, as anyone can learn by consulting Dr. C. Hart Merriam's review of the 'Illustrations of Nests and Eggs of Birds of the United States' in the Bulletin of the Nuttall Ornithological Club, Vol. VII, No. 4, Oct., 1882, pp. 246-249.

The phase of the 'Life-Histories of the Birds of Eastern Pennsylvania' with which we are at present most interested is the voluminous records of bird food which the book contains. It is averred in the preface that more than 700 stomachs of birds were examined. For many of the species of birds lists of from 20 to more than 50 specifically named vegetable and animal food items are given, and the writer is shrewd enough to give quite an appearance of plausibility to these accounts, in that they conform in a way to the commonly observed feeding habits, and the carnivorous or vegetarian tastes of the species. It is manifest, however, that an investigator cannot present lists of from 20 to 50 insects and seeds for more than a hundred species of birds from the examination of 700 stomachs. Seven stomachs per species would certainly not yield so great a variety of items in condition to be fully identified — they might yield no more than three or four. An obtrusive feature of the lists is the recurrence of the same insect names over and over again. These things are against all experience in stomach examination.

Let us examine definite cases in which our glib author goes astray. In his account of the food of the Mourning Dove (Vol. II, p. 304) he lists 8 kinds of insects specifically besides grasshoppers. One is a species of *Harpalus*, a large and hard insect which would perhaps be the last we should expect a dove to swallow. Examinations of more than 250 stomachs in the Biological Survey, and of more than 220 by Mr. E. A. Schwarz of the Bureau of Entomology, show the Mourning Dove to be almost a complete vegetarian. A list of 12 binomial "identifications" is included in the account of the Hawk Owl, a species which occurs in Pennsylvania only in severe winters, and very rarely then. On one page Gentry says he has often seen this bird feeding, while on another he says it is only occasionally met with. Lizards and *Plethodon erythronotus* are mentioned as food items, but it is not explained how this northern breeding bird would get these southerly forms which are dormant during its visits to their range. The same remarks apply to his citation of *Plethodon erythronotus* and *Pseudotriton* [*Spelerpes*] *ruber* as food of the Snowy Owl. The Rough-legged Hawk is said to feed on many snakes, frogs, shrews, moles, bats, weasels and birds, items that subsequent stomach examinations have yielded rarely, if at all.

Six species of spiders are listed as prey of the Ruby-throated Hummingbird, a better record than the Biological Survey has been able to get from the examination of 59 stomachs, and the assistance of the foremost arach-

nologist in the country. Gentry records several species of lepidopterous larvæ as food of nestling Chimney Swifts and Nighthawks, when in fact the food of the young of these species does not vary appreciably from that of the adults and the latter take very few caterpillars.

Twenty species of insects are recorded as food of the Olive-sided Flycatcher, a rare species in eastern Pennsylvania, almost as long a list as the Biological Survey has been able to accumulate from an examination of 63 stomachs. Suspiciously full notes are given for such rare species (in Pennsylvania) as the White-winged Crossbill, Mourning, Connecticut, and Cerulean Warblers. We may inquire also into his statements as to the occurrence of the birds themselves. For instance he says (Vol. I, p. 311) of the White-crowned Sparrow, "from the 20th of April to the middle of May it congregates in flocks of a dozen or more Whilst writing, May 4, vast numbers are daily observed within our gardens and the adjoining fields." The facts are that this sparrow is rare everywhere east of the Alleghenies, and probably never have vast numbers been seen about Philadelphia.

If this work of Gentry's were scientifically accurate, it would now rank as a classic. But regarded with suspicion at first and latterly ignored, its most obvious defect is that it looks too good. Gentry even claims to have identified the eggs and pupæ of certain species of *Cratonychus* (now *Melanotus*), a thing which is to-day impossible for even the best coleopterists.

The 'Life-Histories of the Birds of Eastern Pennsylvania' must be known then as a dangerous mixture of fact and unfact. Its accuracy in some respects gives it a deceptive appearance of verity, but with regard to the records of bird food it is certain that the only safe course is to regard them as almost entirely products of the author's imagination.—W. L. M.

African Economic Ornithology.—An important paper by Austin Roberts distinguishes that writer as a pioneer expounder of the 'Economics of Ornithology in South Africa.'¹ The author considers birds in relation to grain, fruit, poultry, and stock, and also gives a list of scavengers, and of birds suggested for protection. Mr. Roberts says: "Before the advent of white men in South Africa birds affected even the primitive agriculture of the natives; the patchy fields of corn had to be guarded against the same granivorous birds which now trouble us. But the conditions of that time differed widely from those obtaining now, as the grain fields were small and easily protected Soon after the settlement of the country by white men a new feature arose in the introduction of cultivated fruit. Frugivorous birds, formerly dependent upon the precarious supplies of Nature, soon learned to appreciate the better quality and greater quantity placed within their reach, and it is not surprising that they forsook the

¹ Agr. Journ. Union of S. Africa, I, No. 3, April, 1911. pp. 352-369.

wild fruit when that in the orchards began to ripen." Most of the damage to grain is done by finches resident about the fields, and more than 16 species are mentioned, together with notes on their ravages. Some 25 to 30 species are listed as granivorous, but not as yet harmful, while four kinds of doves and pigeons, one crow and a crane are said to indulge in pulling newly sown grain.

The birds injurious to fruit comprise a greater variety including colies, bulbuls, starlings, glossy starlings, parrots, hornbills, white-eyes, sunbirds, and pigeons. Other fruit eaters mentioned are lories, barbets, fruit pigeons and willow warblers.

The avifauna of South Africa is characterized by great variety of scavengers and rapacious birds. Among the enemies of poultry are 3 species of *Astur*, 2 of *Accipiter*, 2 of *Micronisus*, 3 of *Falco*, 1 *Buteo*, 2 *Spizaetus*, 1 *Hieraetus*, 1 *Aquila*, 1 *Milvus*, 1 *Melierax*, 1 *Circus*, 2 *Circus*, and 2 *Bubo*. Five or more other hawks and owls are mentioned as occasional depredators of the poultry yard. The damage is considerable at times, being most severe when the predatory birds are rearing their young. Mr. Roberts believes in protecting poultry, so far as possible, with wire netting, but remarks that this form of protection is not available for game. He states that "There is no means of protecting game from the attacks of vermin except by getting rid of the most destructive kinds, and the results of so doing will seriously affect other interests. At present the country is not in a position to undertake the destruction of any class of bird, and it will have to remain over until a sounder knowledge of their habits has been obtained."

The birds that have a beneficial relation to stock, that is, as tick destroyers, include the oxpeckers, one species of egret, one crow and one starling. Those troublesome to stock farmers, mainly because of attacks on lambs, are 4 eagles of the genera *Spizaetus* and *Aquila*, a lammergeier, a vulture, and a raven. The scavengers listed include 6 vultures of 5 different genera, 2 eagles, generically distinct, a kite, 2 crows and one stork.

In his remarks upon protection, the author presents some very sensible views regarding the tendency for economic values to vary locally, and the advantage of each district having a protected list of its own. He further says: "Only wholly useful birds should be protected, because farmers and others must be allowed to protect their own interests." The birds suggested for protection as friends of the stock farmer are oxpeckers and the buff-backed egret; as consumers of locusts and termites, pratincoles, black stork, white stork and wattled starling; as destroyers of small vermin and insects, kestrels, black-shouldered kite, owls (except the three largest species), swallows, swifts and wagtails; as being beautiful and likely to be exterminated, bluejays or rollers, and the crested crane. Mr. Roberts notes that the English sparrow, although introduced long ago, has not spread very far or become a nuisance, while the common starling of only 25 years standing has become injurious about Capetown.

Another paper on the food of African birds is of greatest interest in its bearing on the relation of birds to insects supposed to be protected by their color, or to show by their color that they are not edible. Mr. G. L. Bates in 'Further notes on the Birds of Southern Cameroon'¹ gives a résumé of the results of six years' field examinations of the stomachs of African birds. He found Coleoptera in 213 stomachs, Orthoptera in 177, ants in 57, other Hymenoptera in 8, scale insects in 32, bugs in 19, termites in 31, slugs and snails in 24, spiders in 85, millipeds in 20, and butterflies in none. Ants, particularly those of tropical countries, are classed by theorists as protected insects, and much is made of their so-called mimics among various other insect orders, yet ants rank fourth in importance in this list of bird foods. The theories that have been built up to explain the mimicking coloration of many butterflies as a result of natural selection absolutely require for their substantiation proof that birds regularly prey upon these insects. Evidence thus far urged as proof of this habit is largely based on experiments with captive birds. As the writer has pointed out in another place,² the results of such experiments have very little if any value as indicating behavior under natural conditions. Actual examinations of bird stomachs reveal butterflies in an exceedingly low proportion of North American birds, and the results of Mr. Bates's examinations during 6 years (in which time 178 stomachs were carefully examined with this particular point in mind), a larger body of good evidence than anyone else is able to produce for tropical birds, are worthy of the serious consideration of the selectionists who have postulated the necessary support for the mimicry theories in the heretofore almost wholly unknown, hence easily and agreeably hypothecated conditions of the tropics.—W. L. M.

Todd and Worthington's 'A Contribution to the Ornithology of the Bahama Islands.'—This paper³ is based upon a collection of 591 skins obtained by Mr. W. W. Worthington, December 28, 1908, to May 8, 1909, on the islands of New Providence, Great Inagua, Acklin, Watlings, Andros and Abaco, and later acquired almost in its entirety by the Carnegie Museum. The critical portion is by Mr. Todd and the 'Narrative and Field Notes' by Mr. Worthington. As the authors present their information in two entirely distinct lists in which the same species usually bears different numbers, an unnecessary burden is inflicted upon any one who may consult the paper. Eighty-four species are treated by Mr. Todd and one hundred and twenty by Mr. Worthington.

In his introduction Mr. Todd discusses the zoölogical relationship of the Bahamas both with relation to each other and to adjacent islands

¹ *Ibis*, 9th ser., V, No. 20, Oct., 1911, pp. 630-631.

² *Journ. Econ. Ent.*, 3, No. 5, Oct., 1910, pp. 437-438.

³ A Contribution to the Ornithology of the Bahama Islands. By W. E. Clyde Todd and W. W. Worthington. *Annals of the Carnegie Museum*, VII, Nos. 3-4. Issued, October, 1911.

and the continent of North America. His conclusions agree with those already advanced by Mr. Chapman and Mr. Riley.

A number of new records are established for several of the islands visited, and a new warbler, *Dendroica flavescens*, already described by Mr. Todd (Proc. Biol. Soc. Washington, XXII, p. 171) was discovered on Abaco.—W. S.

Mathews's 'The Birds of Australia.'—Part 5¹ bears date October 31, 1911, and completes the first volume, except the introductory matter and index, which will form Part 6, and when ready will be sent to subscribers without extra charge. The first volume warrants the liberal praise bestowed upon Part 1 (Auk, XXVIII, p. 135, 136), as regards the character of both the text and plates; and the Parts have thus far appeared with commendable promptness and regularity. The present Part concludes the Ralliformes, and includes also the Podicipediformes and the Sphenisciformes, the species treated being numbered 64–74. In addition to the technical and biographical matter usual to works of this character, the relations of the Australian forms to their congeners are considered, the genera, species and subspecies being critically revised from the author's viewpoint in respect to status and nomenclature. In the present Part the new genus *Mantellornis* is established, with *Notornis hoeckstetteri* Meyer as the type. Two new subspecies of *Porphyrio* are described as *P. melanotus fletcheræ* (Tasmania) and *P. m. neomelanotus* (Northwest Australia), and the little known *Fulica alba* White is considered at length. The only two specimens known to be extant came probably from New Zealand. Three other new forms here described are *Podiceps cristatus christiani*, *Aptenodytes patagonica halli*, *Eudyptula minor iredalia*. We regret that we are unable to agree with Mr. Mathews in the use of *Podiceps* in place of *Colymbus*, and of *Penguinus* in place of *Catarractes*, for reasons already given (Auk, XXVIII, 1911, p. 496). Mr. Mathews now designates as type of *Penguinus*, *Aptenodytes chrysocome* Forster (1781), instead of *Phaethon demursus* Linné, formerly designated by him as the type. Contrary to most previous authors, he now considers Linné's species indeterminate. He states that it, "though undoubtedly a 'Crested Penguin,' is obviously a young bird, and unfortunately must be regarded as indeterminate. Brunnich's genus was certainly founded on the characters of this bird, but as no species was named by him, I herewith designate *Aptenodytes chrysocome* Forster as the type of Brunnich's genus,"—a species, by the way, not described till eleven years after Brunnich's genus was founded! Yet he adds: "The course I now advocate I consider better,

¹ The Birds of Australia. By Gregory M. Mathews. Member of the Australian Ornithologists' Union and the British Ornithologists' Union. With hand-coloured Plates. Volume I, Part 5, London: Witherby and Co., 326 High Holborn, W. C. October 31st, 1911. Roy. 4to. pp. 325–286, pll. 59–67, with 3 full-page text cuts. Price, £2. 2s. per part.

as tending to give more stability to our nomenclature."¹ This is certainly a new departure in type designation, it generally being held that in the case of speciesless genera the type must be some species described before the founding of the genus on which the genus was obviously based. If *Penguinus* was founded on an indeterminable species, the genus itself must necessarily share the fate of the species on which it was founded. Such action is antagonistic, in spirit if not in letter, to Article XXX of the International Code of Nomenclature, which provides that the type selected must be one of the originally included species. Although the characters of *Penguinus* might fit several then undescribed species none of them, when later described, can be properly available as its type.—J. A. A.

Abbott's 'The Home-Life of the Osprey'.—In a little volume² of 53 pages of text and 45 photographic illustrations, Mr. Abbott is able to give an account of the home-life of the Osprey, or Fish Hawk, in minute detail, from long study of the species at various points on the coast of New Jersey, at Gardiner's Island, New York, and at Great Lake, North Carolina, beginning with its arrival in the waters near New York about the end of March and ending with its departure early in October. Although the subject is not a new one, Mr. Abbott has made excellent use of his opportunities and, aided by the camera, has given us a thoroughly complete history of the 'home-life' of this interesting species, as studied particularly at Gardiner's Island and along the coast of New Jersey. Every feature is beautifully illustrated in the accompanying photographs, mostly taken by himself. The varied character of its nesting-sites and nests, its manner of fishing, the care of its young, their development and behavior while in the nest, the devotion of the parent birds to their young and to their homes, its manner of fishing and carrying its prey, are all sympathetically told in the text and effectively illustrated in the excellent plates. The work is a worthy successor of the similar monographic studies that have preceded it in the 'Bird-Lovers' Home-Life Series' of its enterprising publishers, Witherby and Co. of London. In concluding his excellent monograph Mr. Abbott says: "There is a nobility and dignity about this bird, an industry and inoffensiveness of life, a tender affection for its mate and young, that can only bring increasing admiration with acquaintance."—J. A. A.

Publications Received.—Abbott, Clinton G. The Home-Life of the Osprey. Crown 4to, pp. 44, 32 photographic plates. London, Witherby & Co. 6s. net; special ed., 10s. 6d. net. New York, Brentano, \$2 post-paid.

¹ Not italicised in the original.

² The Home-Life of the Osprey Photographed and Described. By Clinton G. Abbott, B. A. Associate of the American Ornithologists' Union. With some Photographs by Howard H. Cleaves, Associate of the American Ornithologists' Union. With Thirty-two mounted plates. London: Witherby & Co., 326 High Holborn, W. C. MCMXI.—pp. 54, 32 photographic pl. Cloth, 6s. net; special edition, 10s. 6d. net. For sale also at Brentano's, 229 Fifth Avenue, New York. \$2 post-paid.

Berlepsch, Hans Graf von. Die Vögel der Aru-Inseln, mit besonderer Berücksichtigung der Sammlungen des Herrn Dr. H. Merton. (Abhandl. Senckenbergischen Naturf. Gesells., XXXIV, 1911, pp. 53-98.)

Bowdish, Beecher S., and Chester A. Reed. Guide to the Birds of New Jersey. Pocket size, 188 pp., 64 colored figures. 40 cents. New Jersey Audubon Society. Address B. S. Bowdish, Demarest, N. J.

Cooke, W. W. Distribution of the American Egrets. Bureau of Biological Survey, Washington. Circular No. 84.

Fleming, J. H. A New Teal from the Andaman Islands (Proc. Biol. Soc. Washington, XXIV, pp. 215, 216, Oct. 31, 1911.)

Forbush, Edward Howe. Annual Report of the State Ornithologist for the year 1910. (From 58th Ann. Rep. State Board of Agric. Massachusetts.)

Howell, Arthur H. Birds of Arkansas. (Biolog. Survey, Bull. No. 38, Oct. 12, 1911.)

Ihering, Hermann von. Bibliographia das trabalhos scientificas. (Notas Prelim. Museu Paulista, Vol. I, fasc. 2, 1911.)

Jourdain, F. C. R. The Bird Life of Corsica. (Bericht Über den V Internat. Orn. Kongress, 1911, pp. 370-391.)

Kellogg, Louise. A Collection of Winter Birds from Trinity and Shasta Counties, California. (Condor, XIII, July, 1911, pp. 118-121.)

Lechner, A. A. van Pelt. Oologia Neerlandica: Eggs of Birds Breeding in the Netherlands. The Hague, Martinus Nijhoff. Part I, 1911. £1. 10 net.

Lowe, P. R. A Naturalist on Desert Islands. London, Witherby & Co., London. 8vo, 1911. 7s. 6d net.

McAtee, W. L. Woodpeckers in Relation to Trees and Wood Products. Biological Survey, Bull. No. 39, Sept. 26, 1911.

Miller, Lyle Holmes. (1) Avifauna of the Pleistocene Cave Deposits of California. (Univ. of California Publ., Geology, VI, No. 16, pp. 385-400. Oct. 28, 1911.) (2) A Series of Eagle Tarsi from the Pleistocene of Ranch la Brea. (*Ibid.*, No. 12, pp. 305-316, Oct. 9, 1911.)

North, Alfred J. Nests and Eggs of Birds found Breeding in Australia and Tasmania. Vol. III, pts. 2 and 3, 1911.

Reichenow, Ant. Über die Fortschritte und den gegenwärtigen Stand der Ornithologie. (Bericht über den V Internat. Orn.-Kongress, 1911, pp. 117-132.)

Riley, J. H. Descriptions of three New Birds from Canada. (Proc. Biol. Soc. Washington, XXIV, pp. 233-236, Nov. 28, 1911.)

Rubow, C. The Life of the Common Gull. London, Witherby & Co., 1s. 6d. net.

Strong, R. M. On the Olfactory Organs and the Sense of Smell in Birds. (Journ. Morph., XXII, No. 3, pp. 619-660, Sept., 1911.)

Swarth, H. S. Description of a New Hairy Woodpecker from South-eastern Alaska. (Univ. of California Publ., Zoölogy, VII, No. 9, pp. 313-318, Oct. 9, 1911.)

Todd, W. E. Clyde, and W. W. Worthington. A Contribution to the Ornithology of the Bahama Islands. (*Annals Carnegie Mus.*, VII, Nos. 3, 4, 1911.)

Wallace, John H., Jr. Conservation of the Game, Birds and Fish of Alabama. Alabama Depart. of Game and Fish, Bull. No. 3, Oct. 1, 1911.

Warren, Edward R. Some Colorado Horned Owl Notes. (*Condor*, XIII, Sept., 1911, pp. 153-156.)

Wood, N. A. The Results of the Mershon Expedition to the Charity Islands, Lake Huron. Birds. (*Wilson Bull.*, July, 1911.)

Wright, Horace W. The Birds of the Jefferson Region in the White Mountains, New Hampshire. (*Proc. Manchester Inst. Arts and Sci.*, V, pt. 1, 1911.)

Annals of Scottish Nat. Hist., No. 80, Oct., 1911.

Avicultural Magazine, (3) II, No. 12, III, Nos. 1, 2, 1911.

Bird-Lore, XIII, Nos. 5 and 6, Oct.-Dec., 1911.

British Birds, V, Nos. 5-7, 1911.

Bulletin British Orn. Club, Nos. CLXXII, CLXXIII, and Vol. XXVIII, 1911.

Bulletin of Charleston Mus., VII, Nos. 6-9, 1911.

Condor, The, XIII, Nos. 5, 6, 1911.

Emu, The, Oct., 1911.

Forest and Stream, LXXVII, Nos. 14-26, 1911.

Ibis, The, (9) V, Oct., 1911.

Journal für Orn., LIX, Heft 4, 1911.

Journal Maine Orn. Soc., XIII, Nos. 3, 4, 1911.

Meriden Bird Club, First Report, 1911.

Messenger Ornithologique, II, Nos. 3, 4, 1911.

Ornithologische Monatsberichte, XIX, Nos. 9-11, 1911.

Ornithologische Monatschriften, XXXVI, Nos. 9-11.

Ornithologisches Jahrbuch, XXII, Heft 3, 4, 1911.

Ottawa Naturalist, XXV, Nos. 6, 7, 1911.

Proceedings Acad. Nat. Sci. Philadelphia, LXIII, Part 2, 1911.

Revista do Museu Paulista, VIII, 1911.

Wilson Bulletin, XXIII, Sept.-Dec., 1911.

Zoölogist, The, (4) XV, Oct.-Dec., 1911.

CORRESPONDENCE.

Cooke's 'Distribution and Migration of North American Shorebirds.'

TO THE EDITOR OF 'THE AUK:—

Dear Sir:—The comments made by Mr. F. H. Allen in 'The Auk' for October, 1911, on certain shortcomings in Cooke's 'Distribution and Migration of North American Shorebirds' seem to call for a few words in reply. I trust to make these as courteous in tone as were the comments.

It is claimed by Mr. Allen that the facts given under the several species are not complete enough to justify the statement made in the introduction, and on a subsequent page, as to the scope of the bulletin. Thus, to show the insufficiency of the data on the breeding and wintering of certain of the Shorebirds, he states that the Northern Phalarope "is a common summer resident in Labrador and breeds along the entire coast," and adds that Cooke might easily have ascertained this by consulting the 'Birds of Labrador' by Townsend and Allen. The fact is that these authors kindly sent Prof. Cooke a copy of their most excellent work immediately after it was published, that it has been on his desk ever since, and has been frequently and profitably consulted. In their statement in regard to the breeding of the Northern Phalarope in Labrador, however, there is reason to believe that the authors are mistaken. Hence their statement, though by no means overlooked, was not accepted.

The present status of the Northern Phalarope as a breeding bird in Labrador is far from satisfactory. In Vol. III of his 'Ornithological Biography,' Audubon gave a circumstantial account of the discovery of the nest and eggs of the bird in Labrador, ending with the statement that "both young and old had departed by the beginning of August." This account of the breeding of the species is explicit enough, and would be entirely satisfactory were it not for the fact that it sharply conflicts with the equally circumstantial account by the same author in his journal, where we find that the only time he mentions seeing the species, is on July 29, when he states:

"I saw this afternoon two, or a pair, of the *Phalaropus hyperboreus*; they were swimming in a small fresh-water pond, feeding on insects, and no doubt had their nest close by, as they evinced great anxiety at my approach. I did not shoot at them, and hope to find the nest or young; but to find nests in the moss is a difficult job, for the whole country looks alike." It thus appears that up to July 29 he had found no Phalarope nests, and, as it seemed to Prof. Cooke impossible to reconcile the two accounts, he decided to pass by Audubon's breeding record, especially since it has not been substantiated by later investigations.

June is preëminently the breeding month for this phalarope. Numerous June records are at hand for different localities in Canada and Alaska, comparatively few are as late as July. It is significant that of 70 nests found by McFarland at Fort Anderson, July 10 was the latest date, most of them, even in this far northern locality, being in June. In more southern localities, the bird would naturally be expected to nest earlier.

The fall migration of the Northern Phalarope is well under way by the middle of July, so that the mere presence of the birds anywhere after that date cannot be accepted as definite proof of breeding. The two birds seen by Audubon July 29 were doubtless migrants, and the date agrees well with the dates at which migrating phalaropes have been noted by subsequent observers. Brewster found no nests in the Gulf of St. Lawrence region, and does not record the bird as absolutely identified by him until July 25; Bigelow found no nests, and saw no birds until July 23. It is true that in his 'Birds of Northeastern Labrador' published in 'The Auk' for January, 1902, he gives the bird as "Common. Breeding in almost all the suitable marshes; occasionally very abundant off-shore." This again on its face value would be satisfactory as to the essential fact that this phalarope breeds on the Labrador coast but in a recent letter to Prof. Cooke, Mr. Bigelow states that he did not find *nest or eggs of the bird* but found the birds in the marshes at Poutes Cove on July 23 [thus well within the migrating period], and adds that his reason for stating that they breed there was that the natives assured him the birds observed [in 1902] were nesting. While this testimony by the natives may have been convincing to Mr. Bigelow, it cannot, we submit, without further evidence, be accepted as definitely establishing the breeding of the species in the locality in question, especially when is taken into account the late date, July 23.

Townsend and Allen found neither nests nor young, and saw no birds until July 27. Hence the statement in their 'Birds of Labrador' that "The Northern Phalarope breeds along the entire Labrador coast in freshwater marshes on the borders of ponds and lakes" would appear to have been based on the statements of the authors they subsequently name (Audubon, Low, Bigelow, Turner and Spreadborough) rather than on their own observations. If the species really breeds generally on the Labrador coast, it should have been noted by Coues, who had far better opportunity of observation than any of the observers above mentioned. As a matter of fact he did not find the bird at all, while Low, who afterwards visited the same district, does not mention meeting with the bird in the breeding season until June 13, when he was far inland from "Labrador" near the head of the Hamilton River. Spreadborough's account refers to James Bay and hence has nothing to do with the Labrador coast. So that as the matter now stands, "Ungava Bay, about 59° N. (Turner)" is the most southern certain record of the breeding of the Northern Phalarope on the Atlantic coast, as is given in Bulletin 35, 'Distribution and Migration of North American Shorebirds.'

A word may be added in regard to the breeding and winter ranges of the

several species treated in the bulletin. It was intended to make the report as complete as possible in this respect. It was being written at the time the third edition of the A. O. U. Check-List was in course of preparation, and both literature and museums were ransacked to make the statements on these two phases of the subject as complete and exact as time and pains could make them. While it is too much to expect that the bulletin is faultless in these regards, nevertheless in the year since it was published no one has pointed out any defects, and during that period of work on ornithological literature, Prof. Cooke has found no omissions that should have been included. No doubt, however, it will be found later that matter was omitted that might profitably have been utilized, and we shall be duly grateful to friends who will call our attention to such omissions with a view to greater completeness in future publications on the same general subject.

Turning now to the migration side of the question, an entirely different problem is presented. No claim is made or even suggested in the bulletin that the data presented on migration are full and complete. In fact the explicit statement is made that the dates of migration "have been obtained principally from the migration schedules" in the possession of the Biological Survey. Ornithological literature, especially of the present time, is too voluminous for one man, however industrious, to transcribe all the dates of occurrence. In the case of this particular bulletin another item had to be taken into account. The size of the bulletin was necessarily limited to 100 pages, and this allowed only a small part even of the migration data now in hand to be used. Our records contain 45,000 cards on the *Limicolæ*, alone, an amount of material far too great to be more than abstracted in a bulletin of such limited size.

The failure to include in the Shorebird bulletin the data from two such important works as the ones our critic mentions: 'Birds of Essex County' by Townsend, and 'Birds of the Cambridge Region' by Brewster, can neither be explained nor defended except on the ground of human liability to error. In a work which necessitates the consultation and transcription of such a vast amount of literature no author is liable long to escape criticism for errors and omissions, and we shall endeavor to accept our share of merited rebukes with becoming resignation.

In conclusion a word may be added in regard to the great mass of ornithological data now on file in the Biological Survey. This includes over 700,000 cards from all sources, migration schedules, specimens in museums and in the hands of private collectors, and references to ornithological literature. With regard to the last named source, Prof. Cooke has about completed the abstracting of the standard serials, the government publications, the various State lists, and has made considerable progress with the multitude of non-serial publications. He has consulted nearly every American reference quoted by Coues in his three bibliographies and more than twice as many in addition, the whole making more than 20,000 titles and considerably over 200,000 notes on species. It would seem that this amount of material, while confessedly by no means covering the entire

field, is worthy of a more complimentary statement than the one penned by our critic to the effect that the bulletin on Shorebirds contains in addition to official data "some reference to the literature."

Very truly yours,

HENRY W. HENSHAW.

Washington, D. C., Nov. 20, 1911.

Mathews's Notes on Nomenclature.

TO THE EDITOR OF 'THE AUK':—

Dear Sir:—In the last number of 'The Auk,' I have been granted an extended review of my notes on Nomenclature published in the *Novit. Zool.*, Vol. XVII, pp. 492–503, Vol. XVIII, pp. 1–22, *Emu*, Vol. X, pp. 317–326, and Vol. XI, pp. 52–58. That review will be widely read by American ornithologists whereas my original papers will not have such an audience. Inasmuch, therefore, as I feel my views have been somewhat vigorously treated, I would claim space for a short defence of my papers.

The review is principally a defence of the Brissonian genera without recourse to the refutation of the facts I produced against their acceptance. I implicitly obey the "Laws formulated by the International Congress of Zoölogists," and the reviewer wrote: "Instead of accepting, however, the ruling of the Commission on the meaning of its own Code he proceeds to argue that the Commission is wrong"; and then: "It is hard to reconcile this action with his repeatedly professed absolute adherence to 'the laws formulated by the International Congress of Zoölogists.'"

The reviewer has confused the Laws with the Opinions rendered by the Commission. I have never questioned the Laws and "the Commission has no legislative power." Refer to Opinion 16, where after nine pages of discussion the only cases where an Opinion was necessary were left to be decided by the first author who had occasion to use them, and the sentence passed "If any author attempts to construe the cases under the present ruling the burden of proof to show he is justified in this procedure rests upon him."

However the reviewer further wrote: "As a matter of fact, it is perfectly evident that the Commission intentionally employed the term binary for the purpose of conserving genera established by non-binomial authors of dates subsequent to 1758," yet carefully refrained from noticing my appeal to the Laws which I here again quote:

"*Article 25.* The valid name of a genus or species can be only that name under which it was first designated on the condition:

"a. That this name was published and accompanied by an indication, or a definition or a description; and

"b. That the author has applied the principles of binary nomenclature.

"*Article 26.* The tenth edition of Linné's 'Systema naturæ,' 1758, is the work which inaugurated the consistent general application of the binary

nomenclature in zoology. The date, 1758, therefore, is accepted as the starting point of zoological nomenclature and of the law of priority."

Inasmuch as the meaning of the word binary, here first used instead of binomial, is explained by the context it can have none other than what I have claimed. I cannot imagine the arguments whereby the reviewer could make it "perfectly evident, as a matter of fact," to be otherwise; from the facts which I have here quoted, I cannot admit any other meaning of binary than binomial and until Article 26 is altered I must maintain the position I have taken up. It has been suggested by supporters of the Commission's Opinions that, my arguments, on the facts, being unanswerable, this course should be adopted. Is further discussion necessary? The untenability of the Commission's Opinion is thereby admitted.

With regard to the reviewer's remarks: "Unfortunately for Mr. Mathews his statements in regard to Brisson and *Colymbus* are erroneous." "If Brisson's genera continue to be used, as they certainly will be, *Podiceps* is properly to be construed as a homonym of *Colymbus* (Brisson ex Linné)."

Whether my statements be regarded as erroneous or not depends upon whether they are criticised from the standpoint of opinion or of facts. I was only dealing with the latter and herewith point out the difference between the reviewer's opinion and facts. Reference to Brisson, Vol. VI, p. 33, does not lead us to conclude that Brisson used *Colymbus* ex Linné, and on p. 34 Brisson calls La Grebe *Colymbus*. By application of a method of tautonymy this could be accepted as the bird reckoned as type of Brisson's genus and accordingly the one from which Brisson formed his generic name. Now the first reference under that species reads *Colymbus Moehr. Avi. Gen. 77*, and no mention is made of Linné though ten references are given.

Now, whose statements are erroneous as to the origin of Brisson's *Colymbus*, the reviewer's or mine? It would be most interesting reading for me to see the reviewer's justification (on facts) of the statement "Brisson did it [subdivided a Linnean genus] in a large number of cases, intentionally and with good effect, adopting most of them in a restricted sense."

Allen, when collating the Brissonian and Linnean Genera (Bull. Amer. Mus. Nat. Hist., Vol. XXVIII, pp. 317-335, 1910), noted (p. 319) that Brisson only had Linné's 10th Edition after four volumes (out of six) of his work had been printed; he could not have subdivided many of the Linnean genera under those conditions, unless genera introduced BEFORE 1758 are admitted. An examination of those two last volumes does not reveal, to me, facts in support of the reviewer's statement.

The reviewer notes: "*Marila* Oken is rejected in favour of *Nyroca* Fleming on the assumption that Oken's bird genera of 1817 are untenable."

It is peculiar that though the A. O. U. Check-List, p. 74, includes *Marila* Oken 1817, and p. 76, *Clangula* Oken 1817, on p. 79, *Somateria* Leach 1819 is used though there is the prior *EIDER* Oken 1817. On p. 80 *Oidemia* Fleming 1822 is retained though there is the prior *MACREUSE* Oken 1817;

and p. 47 *Anous* Stephens 1826 though there is the prior *Noddi* Oken 1817. Why this inconsistency? I have consistently rejected all the Oken names. If they are tenable why did not the A. O. U. include all, in the Check-List? Were they in doubt as to the Latin form of the neglected names?

The reviewer further notes: "*Enanthe* Vieillot is accepted for the Wheatears on the ground that the type of *Enanthe* rested on tautonymy (*Motacilla enanthe* Linn.) before a type was fixed for *Motacilla*." This is a quaint summary of my note regarding the nomenclature of the Wheatears and Chats and scarcely in accordance with the facts.

The other matters wherein the reviewer differs from myself can be regarded as matters of opinion upon which I prefer to leave myself to the judgment of the succeeding generations. It is being proven every day that in science right will right itself, and I am simply working for the advancement of the science I love, that of Ornithology.

GREGORY M. MATHEWS.

Langley Mount,
Watford, England.
18/11/11

[The reviewer of Mr. Mathews's papers on the Nomenclature of Birds regrets that his criticisms of certain opinions held by their author has given him cause for a reply, inasmuch as the reviewer fails to see wherein he was at any point in serious error. Respecting Mr. Mathews's position in the matter of Brissonian genera, the reviewer is quite content to let him have the last word until the International Commission has formally rendered an opinion on their availability and the Congress itself has either adopted or rejected it, and then to abide by the decision of the Congress.

The question of *Podiceps* and *Colymbus* is, however, a separate issue which can be discussed wholly on the basis of facts. As Mr. Mathew truly says: "Whether my statements be regarded as erroneous or not depends upon whether they are criticised from the standpoint of opinion or of facts. I was dealing with the latter and herewith point out the difference between the reviewer's opinion and facts. Reference to Brisson...[etc., see Mathews above]. Now whose statements are erroneous as to the origin of *Colymbus* [i. e., whether from Linné, 1758, or from some earlier source], the reviewer's or mine?" He says further: "It would be interesting reading for me to see the reviewer's justification (or facts) of the statement 'Brisson did it (subdivided a Linnean genus) in a large number of cases, intentionally and with good effect, adopting most of them in a restricted sense.'"

The reviewer will here endeavor to give Mr. Mathews this "interesting reading," taking the case of *Colymbus* first, and then a few other genera, — all from Brisson's last two volumes, which were printed *after* he received Linné's ed. 10 of the 'Systema Naturæ,' — which Brisson subdivided "intentionally and with good effect."

First as to the origin of *Colymbus*. *Colymbus* is essentially the same group, with the same name, in Linné's ed. 6 (1748) as in his ed. 10 (1758),

and Moerhing's *Colymbus* is simply Linné's genus of 1748, which he cites, but of course without mention of any species. But so far the origin of Brisson's genus *Colymbus* is concerned, it is necessary to go back only to Linné's 1758 edition of the 'Systema,' although Mr. Mathews seems to imply otherwise. He says: "Reference to Brisson, Vol. VI, p. 33, does not lead us to conclude that Brisson used *Colymbus* ex Linné, and on p. 34 Brisson calls La Grebe *Colymbus*.... Now the first reference under that species reads *Colymbus* Moehr. *Avi. Gen.* 77, and no mention is made of Linné though ten references are given." This statement is quite true as regards Brisson's cited references under his first species, but it has no material bearing on the point at issue, as shown by the following facts.

Colymbus Linné, 1758, contained 4 species: (1) *arcticus*, (2) *cristatus*, (3) *auritus*, (4) *podiceps*, the first being a loon, the other three grebes. Each of the three grebes are duly cited by Brisson in his Vol. VI, as follows: (1) " *Colymbus cristatus*. Linn. *Systh.* [sic] *Nat. ed.* 10. *Gen.* 68. *sp.* 2." p. 46; (2) " *Colymbus auritus* Linn. *Systh. Nat. ed.* 10. *Gen.* 68, *sp.* 3." p. 50; (4) *Colymbus*.... *Podiceps* Linn. *Systh. Nat. ed.* 10. *Gen.* 68. *sp.* 4." p. 63. Linné's remaining species, *arcticus*, is cited in the same Volume, p. 115, under *Mergus*, as: " *Colymbus Arcticus* Linn. *Systh. Nat. ed.* 10. *Gen.* 68. *sp.* 1."

Thus Brisson divided Linné's genus *Colymbus* of 1758 (ed. 10) into two by retaining all the grebes in *Colymbus* and removing the single species of loon to his genus *Mergus* (not *Mergus* Linn., 1758 and 1748) in which he placed all the other loons known to him, thus bringing all the grebes together in one genus and all the loons together in another, for the first time completely separating them as distinct genera. He conserved Linné's generic name *Colymbus*, in which he retained three of the original four species, and made a new genus for the fourth. If this is not subdividing Linné's genus *Colymbus*, and on the basis of Linné's ed. 10, I fail to understand the meaning of the word subdivide!

This is only one instance out of 14 where Brisson subdivided Linné's genera in Vols. V and VI of his work on the basis of Linné's ed. 10, which he cites throughout both of these volumes, giving references not only to this edition, but in each case citing the genera and species by numbers as well as by name, in the manner illustrated above under *Colymbus*, and generally in addition to this quoting Linné's diagnosis in full. These other 13 genera, taking them in the order of Brisson's work, are the following:

Struthio, divided into 4 genera — *Struthio*, *Rhea*, *Casuarius*, *Raphus*, the original genus *Struthio* being conserved in its present modern sense.

Charadrius, divided into 2 genera — *Pluvialis* and *Himantopus*. In this case the original name is replaced by *Pluvialis*.

Tringa was divided into 5 genera — *Tringa*, *Vanellus*, *Arenaria*, *Glareola*, *Phalaropus*, in this case the original name being conserved.

Scolopax, divided into 3 genera — *Scolopax*, *Limosa*, *Numenius*, the original name conserved.

Ardea, divided into 3 genera — *Ardea*, *Ciconia*, *Balearica*, the original name conserved.

Fulica, divided into 3 genera — *Fulica*, *Porphyrio*, *Galinula*, the original name conserved.

Alca, divided into 2 genera — *Alca* and *Fratercula*.

Diomedea, divided into 2 genera — *Albatrus* and *Spheniscus*.

Phaethon, divided into 2 genera — *Lepturus* and *Catarractes*.

Larus, divided into 2 genera — *Larus* and *Stercorarius*.

Anas, divided into 2 genera — *Anas* and *Anser*.

Pelecanus, divided into 3 genera — *Onocratalus*, *Sula*, *Phalacrocorax*.

The same method with reference to Linnean genera was pursued by Brisson in his first four volumes as in his last two, with the difference merely that he had not Linné's ed. 10 to consult at the time his first four volumes were printed and he accordingly had no recourse but to take them from the 1748 edition. This matters little, since the genera under discussion are the same in the 1748 edition as in the 1758 edition, except that in some instances a few more species were included in them in 1758 than in 1748. These also number 14, which Brisson divided into 33 genera, nearly all of which are still current, many of them with the limitations Brisson originally assigned them.

The reviewer's "quaint summary" of Mr. Mathews's note on *Ænanthe* was not intended as a summary of his note, but as a statement of certain conditions in the case, and as such is correct.

Respecting *Marila* Oken, and the other Oken genera of 1817, the reviewer is willing to abide by any ruling of the International Congress respecting them but confesses that his sympathies and inclinations are, personally, with Mr. Mathews

J. A. ALLEN.]

NOTES AND NEWS.

DR. J. A. ALLEN finding that his health demanded relief from some of his numerous responsibilities, has been forced to resign the editorship of *THE AUK*, and the Council of the American Ornithologists' Union, at the recent meeting in Philadelphia, chose Mr. Witmer Stone as his successor. Simultaneous with Dr. Allen's retirement Mr. Frank M. Chapman resigned as Associate Editor.

Beginning with the initial volume of the Bulletin of the Nuttall Ornithological Club, and continuing to the present year, Dr. Allen has, without intermission guided the course of this journal and its successor *THE AUK*; and the series of thirty-six volumes stands as a perpetual monument to his ability, and his painstaking devotion to the cause of ornithology and the interests of the American Ornithologists' Union. There have been few continuous editorships of equal length in the history of scientific periodicals.

Dr. Allen has kindly agreed to see the present number, already partly under way, through the press, but hereafter all articles and communications intended for publication and all books and publications for notice should be sent to Mr. Witmer Stone, Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

THE rapid decrease in the number of bird collectors is a matter that has attracted the serious attention of ornithologists in the past few years. It is certainly true that there are to-day, very few young men engaged in forming a collection of bird-skins, formerly regarded as a *sine qua non* to the development of an ornithologist. So serious has this matter appeared to some, that it has been suggested that the A. O. U. Committee on the Protection of North American Birds might well be changed to a Committee for prevention of the extermination of North American ornithologists. The abandonment of collecting is charged to the stringency of the State laws, some of which make the acquirement of a collecting permit impossible, while others impose such limitations as to make it useless for scientific purposes. The Audubon Societies have been blamed for this condition of affairs, but we believe wrongly. In practically all of the bills endorsed by the Audubon Societies proper provision is made for scientific collecting, but the legislative committees and State game commissions, without adequate knowledge of the needs of ornithology, have frequently altered the bills, or so administered the laws, as to make the procuring of a permit difficult or impossible.

On the other hand it often happens that among those who have secured permits in the past there are some who have displayed little or no sympathy with citizens who prefer live birds to dead ones, and armed with their permits they have carried on collecting close to houses and grounds in a manner which has made them very obnoxious. These men are naturally

regarded as examples of 'scientific ornithologists' and it is no wonder that they arouse opposition to the granting of any collecting license.

We believe that legitimate collecting is indispensable to ornithological research, and that such collecting in the past has had a negligible influence upon the abundance of our birds. Therefore it seems that the A. O. U. Protection Committee would confer a great benefit upon ornithology if it undertakes, as suggested at the recent meeting of the Union, to place the needs of ornithological collecting in its true light before the State game commissions and similar bodies; and also to bring all collectors to a full realization of the responsibility which rests upon them of prosecuting their collecting in a manner that will not prove obnoxious to their fellow citizens, and arouse antagonism against ornithologists at large.

There is still another side to this discussion. Perhaps, after all, the stringency of the laws is not the only, or even the main reason, for the decrease in the number of collectors. Many of the younger zoologists in the eastern United States started in their scientific work as ornithologists and as collectors of skins, but later abandoned birds for some other group of animals; not because of difficulty in collecting birds but because they found better opportunities in other fields for original discoveries in local systematic work. There is a limit to the number of species and subspecies worth describing in any area, and so far as the study of the birds of eastern North America is concerned, that limit has practically been reached.

But systematic ornithology is after all only a branch of systematic zoology, and Ornithology in its truer and broader sense, has to do with Anatomy, Animal Behavior, Development and Meaning of Coloration, and other broad problems of evolution, just as much as with systematic work. In many of these fields birds furnish exceptional opportunities for the investigator, and moreover the collecting of skins in connection with such work is by no means a necessity, while the investigator is just as much an ornithologist as is he who concerns himself wholly with the study of specific and subspecific differences.

So, even while we maintain that collecting birds is still a necessary part of ornithological science in many parts of the world, and will always be so in anatomical and certain other lines of investigation, nevertheless wherever the systematic side of ornithology becomes practically a completed study, we must naturally expect to find a decrease in collectors, and this without danger of ornithologists becoming extinct.

As in previous years, the Museum of Vertebrate Zoology of the University of California was active during the past spring and summer in carrying on zoological field work. This year the work was conducted entirely within the State of California, in accordance with the principle that a knowledge of the native fauna is of first importance to a State institution of this kind.

The three months from March to May, inclusive, were occupied in exploration of the San Joaquin Valley along its entire length, the particular

purpose being to ascertain the status of the rodent population of the region. Incidentally specimens of certain desirable birds were secured, and much information relative to local bird distribution was obtained. This work was prosecuted by Mr. Swarth and Mr. Grinnell, with two assistants.

Miss Annie M. Alexander and Miss Louise Kellogg with two assistants spent the three summer months in the high mountain region of Siskiyou and Trinity Counties, collecting birds and mammals, in continuance of work begun by them during the previous winter. The series of specimens gathered includes several species new to the Museum, one bird being new to the known fauna of the State, while much information bearing upon the relationships of the Shasta and coast faunas was obtained.

The period from June 15 to September 15 was occupied in exploration of the mountainous region lying between Tehachapi Pass and Mount Whitney. Mr. Grinnell, Mr. Taylor, and three assistants were engaged in this work, the results comprising, aside from large series of specimens of mammals, birds, and reptiles, an increased knowledge of the complex faunal conditions at the southern end of the Sierra Nevada.

All of the above field work was made possible through special gifts by Miss Alexander of funds for its support.

MR. SAMUEL N. RHOADS returned from Ecuador early in August after a very successful trip of about six months. He collected at various points along the railroad which runs from Guayaquil to Quito, especially at Bucay (975 ft.), on the Chanchan River (2000 ft.), Huigra (4000 ft.), Mt. Pichincha (8000 ft.), Riobamba (10,000 ft.), and in the vicinity of Quito. He brought back about 1600 birds, some mammals and reptiles, and a number of invertebrates. His collection is now at the Academy of Natural Sciences, Philadelphia.

MR. ROY C. ANDREWS, Assistant Curator of Mammalogy in the American Museum of Natural History, sailed for Korea, December 13. He expects to spend about two months at the whaling stations there, for the purpose of studying and securing specimens of the California Gray Whale, and Humpbacked Whale. He then plans a trip into the mountains of northern Korea, known as Chokaku San, where about four months will be spent in collecting mammals and birds, if possible in regions not hitherto visited by zoölogists.

MR. ALEX. WETMORE will represent the Biological Survey, U. S. Department of Agriculture, in Porto Rico this winter, coöperating with the Insular Board of Agriculture in studying the economic relations of the birds and mammals of the island.

MR. E. A. GOLDMAN of the Biological Survey will return to Panama about January 1, 1912, to resume his investigations of the birds and mammals of the region.

PART V of Ridgway's 'Birds of North and Middle America' appeared on November 29. Part VI we learn is well under way and partly in type. The whole will now probably run into nine volumes instead of eight as originally estimated.

DR. EDGAR A. MEARNS sailed on October 28 for London to join Mr. Childs Frick on an expedition to Abyssinia and Lake Rudolf. The members of the expedition will include, besides Dr. Mearns, Mr. Childs Frick, son of Mr. Henry C. Frick of Pittsburgh; Mr. Blick, a friend of Mr. C. Frick, and a physician. The country it is planned to explore will be primarily Abyssinia, but the trip will be extended into British East Africa, and include the region about Lake Rudolf. It is intended to make as complete a collection as possible of the mammals and birds of the regions visited, Dr. Mearns giving his attention to the birds and small mammals, which will go to the National Museum. The country it is proposed to traverse will be mainly outside of that visited by the Roosevelt expedition, thus enabling Dr. Mearns to become personally familiar with areas having an important relation to the faunas he has already studied in other parts of Africa. The new material thus obtained will supplement in an important way that already acquired from the African region by the National Museum, and be of great importance in working out the collections gathered by the Roosevelt expedition. As both Messrs. Frick and Blick, as well as Dr. Mearns, have had previous experience in African wilds, important results may be expected from their present extended expedition.

WITHERBY AND COMPANY, London, announce the early publication of 'A History of the Birds of Colorado' by William Lutley Slater, lately director of the Colorado College Museum. The volume is to consist of 500 pages and 16 full-page plates from photographs, and the edition will be limited to 550 copies. Subscription price for the United States, \$5.

The prospectus states that the avifauna of the State has never been hitherto adequately dealt with, and in the present volume an attempt has been made to give (1) Short descriptions and keys of all the birds, some 392 in number, hitherto recorded from the State. (2) An account of the distribution of each bird without and within the State. (3) A short notice of its habits, and (4) A list of references to its occurrence in the bird literature of Colorado.

American ornithologists will look forward with much interest to the appearance of Mr. Slater's volume.

BIRD-LORE for December closes the thirteenth volume of this magazine, which contains almost twice as many pages as Volume I. This increase in size is, in part, due to the natural growth of the magazine, and in part to the publication in it of the Annual Report of the National Association of Audubon Societies, which occupies about one half of the present issue.

This report includes an outline of the work of the Secretary for the past year, under the heads of 'Legislation,' 'Field Agents and other Workers,' 'State Societies,' 'Bird Colonies,' 'Wardens,' 'Egret Protection,' the 'Mrs. Russel Sage Fund,' 'Miscellaneous,' and 'Financial.' The report of the Secretary, Mr. T. G. Pearson, is followed by reports from field agents in New England, on the Pacific coast, in Texas, in Virginia, and from various bird colonies. Added to this are reports from the thirty-eight State societies which form, as it were, State agencies for the National Association, and which can deal with local issues far more effectively than could a national organization not familiar with local conditions.

The report of the Treasurer, Dr. J. Dwight, Jr., shows that the income of the Society for the year ending October 20, 1911, was \$36,599.72, of which no less than \$10,000 was made up of special contributions, and it is hoped that as the increasingly important work of the Association, with its State allies, becomes more widely known, it will receive even greater financial support from the public. The report in question is one of the best arguments which the Association could put forth as an appeal for funds with which to carry on its work, the limits of which are governed only by its means. The past history of the whole movement for bird protection has been one constant struggle to secure, retain, and enforce proper legislative measures designed to protect birds. Up to the present time the efforts of the Audubon Societies have of necessity been so largely directed toward this end that they could not devote due attention to the educational aspects of their work. In the future, however, let us hope that public sentiment has become so thoroughly aroused that there will be less danger of the repeal of the excellent laws which, generally speaking, prevail throughout the Union, and that in consequence the National Association may devote a greater part of its time and income to the diffusion of knowledge of the economic and æsthetic value of birds.

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BIRDS OF THE PARAMO OF CENTRAL ECUADOR.

BY SAMUEL N. RHOADS.

PARAMO is the name for the treeless zone of the Andean Mountains which reaches from the lower border of perpetual snows to the upper border of the tree line. This zone corresponds in western Ecuador to the areas found between the elevations of 12,000 and 14,000 feet. It is wide or narrow according to the relative steepness of the mountain sides between these elevations. While the transition area between the lower Paramo and the upper tree and bush line is more or less an interlocking of the two, and some stunted trees are found in sheltered gorges far up into the typical Paramo, there is no mistaking the region as soon as you near its lower edge, after a strenuous climb through the diminishing forest. You are then in the tussock-grass country. This tussock-grass, and the numerous minor plants and shrubs which crop out among it, feed numberless herds and droves of cattle, horses and sheep, a chief source of revenue to the owners whose vast haciendas often reach up, from the lofty *tierra templada*, five thousand feet higher into the abodes of everlasting snow.

Until the Andean traveler reaches the Paramo he can have no right conception of the immense grandeur of the Andean chain of the Cordilleras. Before that event he is so hemmed in by narrowing gorges, by chain upon chain of foothills, or by suspended oceans of vapor and clouds, that he begins to say in his heart, "There are no Andes; Chimborazo is a dream and Cotopaxi pure

fiction." It was with some such feeling as this that my companion, Mr. R. S. Lemmon and myself saw our camp outfit lashed to the back of an Indian pony in the barnyard of Hacienda Rosario on one of the few really decent Ecuadorian days of last May. We had come up from Quito, six miles distant, about two weeks before and had here made the southern foothills of Mount Pichincha our happy hunting grounds. Thanks to the kind offices of that veteran naturalist and Consul of Quito, Ludovic Söderström, and to the liberality of Mrs. Espinosa, the wife of its owner, we had been enjoying glorious days at Rosario and were rewarded by many a choice skin of the Hummingbirds, Wood Wrens, Flycatchers, richly colored Cotingas, Tanagers and what-nots which flourished there. But as yet we had only caught mere glimpses of the historic old crater, 4000 feet above us, which has stood muffled guard so many centuries, over the ancient citadel of the Incas. It was completely cut off from our "Casa" view by the broad shoulder of forest-covered rocks and the gorges above the farm-house. Our rambles rarely took us far enough to see around that shoulder and then only to be confronted by the mocking vapors which ever half reveal and half conceal the upper world of Ecuador in the rainy season.

It was the first day of May when we struck out into the wooded mountain trail above Rosario's hamlet, followed by our Indian and his sure-footed pony, and, selecting the cattle paths of the nearest quebrada, we made short-cuts for the Paramo. In about two hours we began to see more daylight and some fine scenery, and at 12,000 feet, the tussock-grass began as it were to reach down its finger-tips into the forbidden grounds of the rapidly dwarfing tree growths. Bushes briefly held sway among these and even up here the brilliant hued red and black Tanagers and Violet-ear and Puff-leg Hummers had ventured to fly upon the heels of the sub-arctic Finches and such Formicarian and Dendrocolaptean species (pardon the technicality) as had been more specially fitted for what we might call a grazing, as contrasted with an arboreal, life. As soon as we reach the long grass and low bushes, a sturdy Finch, *Phrygilus unicolor* (D'Orb.) of bluish slate color, almost as large as our Fox Sparrow, flushes, flies ahead and drops into the grass. Another, of the same size, brownish and streaked, alights

upon a nearby bush. Both are shot, and as the brown one was apparently singing, they are thought to be quite distinct, but later experience shows them to be male and female. Now there crawls up the stems of a taller tussock, in much the manner of a Seaside Finch, a sharp-billed, spiny-tailed and streaked little bird, *Siptornis flammulata* Jard., which looks a very hybrid in color and habits between an *Ammodramus*, a Wren, and a Bush-Tit. It belongs to the great Wood-Hewer family, *Dendrocolaptidae*. These streaked Sedge Creepers here took the place of their longer tailed cousins *Synallaxis* of the bushes of the *tierra templada*, which had so long wearied us with their tiresome "te-cheek, te-cheek," ever since we had landed. They carried the range of this type almost up to snow line from the upper edge of the hot country or "*tierra caliente*."

A few hundred yards, and we are fairly into the Paramo, surveying complacently the tree tops, pastures and cultivated fields below us without obstruction, save as the fickle vapors hide them momentarily from view. Raising our eyes, the dim outline of the snowy cone of Cotopaxi slowly focuses itself far, far away to the south, high above the backbone of the Western Range. A thousand rounded, intervening summits form its setting. Close by, a familiar note suddenly reminds us of home; a Wren cry surely. Beating about, we are rewarded by securing a specimen of the Andean Marsh Wren, *Cistothorus brunneiceps* Salvin, which we had found breeding in the *Juncus* bunches below Rosario at 10,000 feet, the lower limit of its range. But we must turn our backs on trifles, and, trudging now among the maze of cattle trails that intersect the sedge, we become painfully aware of our great elevation and the difficulty of following the steady pace of our native guide. Suddenly, along the edge of a dry ditch, a large Snipe-like bird, *Gallinago nobilis* (Selater), flushes at our feet and disappears over the nearest knoll. These are called "Woodcocks" by the English inhabitants of Quito, who esteem them fine game. They do not frequent marshy tracts and live almost entirely in the open, dry Paramo plains among the tussock-grass. In the same places, where the sedge grows dense and high, the peculiar, Grouse-like Tinamous hide. When one of these strange, short tailed birds takes wing, giving voice to its piercing, half whistling, half shrieking succession of notes, one is reminded, amid the novel confusion, of a bobtailed

Buff Cochon Pullet suddenly transformed into a winged cannonball. Of course one's first shot at such a spectacle is a clear miss and the bird seems to fly, and fly clear out of the country, as you watch its exit.

Much to our surprise the everlasting stumptailed Ant-thrushes, *Grallaria monticola* (Lafr.), of the *templada* bush-regions, common as far down the line as Huigra (4000 feet), have even followed us up here, into the wide open middle Paramo, to an elevation of 12,500 feet. The next day several of them were noted on a scantily wooded cliff, near camp, as high as 13,500 feet. This is a wide range for a bird of such limited powers of flight. In fact it is almost impossible to force this humpty-dumpty, thrush-like bird to open its wings, its long, robust legs enabling it to leap and jump and run with almost as much address as the famous long-tailed *Paisano* or Road-runner of Mexico. Strange, is it not, that such diversely feathered birds should have such similar habits? Nothing can be more tiresome than the three-cornered "Wu, weeo, weeu" or whistled song of this constantly invisible bird. Especially does this apply to the feelings of the collector, who has tried vainly from day to day to locate and secure the singer, which sits motionless in a low bush, or on the ground beneath, in such a way as to be completely obscured. The notes are ventriloquial, and you may actually walk away from it in endeavoring to get closer. Another bird of wide range, which comes up this far, is the tiny and fantastic little streaked Flycatcher with its Padrewski hair, the *Anairetes parulus* (Kittl.). It follows the occasional bunches of stunted trees on the quebrada sides to 13,000 feet, where also a high ranging Warbler was seen. Two other species of Sparrows were noted in the grass, and a dainty, buff colored Titlark, *Anthus bogotensis* Scl., of about the size of ours, but noticeably different in being able to fly without the inevitable snickers of *A. rubescens*. Perhaps the grandeur and solemnity of their habitat has subdued the frivolity of this genus in the Andean bird.

Our Paramo camp was located near the highest point where fuel could be secured, and in a pass which presented on the east a precipitous bluff of rocks leading on up directly to one of the lower peaks of Pichincha's summit. We had been warned against cold, and had endeavored to provide for it, but our first night was a

"terror," or, at best, an eight hour "shiver," without even the consolation of being frozen, for the mercury has the faculty of hovering at about 32° to 34° by night during the centuries at this charmed spot, nine miles below the Equator and two and a half miles above the sea. Dry wood was "excessively rare" (as they say in auction catalogs), and any kind of wood or grass or fuel, native to such a region, or even imported into it, is so loath to burn in that rarefied air, that we were lucky to even warm our beans and rice and chocolate in time to "turn in" at 6.30. By dark the eternal snows or rather sleet, began to fall and we were forced to "bunk up" to keep warm. Did I say, "keep warm?" Well, we *did not* keep warm, though we had enough on and about us to have withstood a zero temperature at sea level in the same outfit. I began to realize about ten o'clock that sleep was out of the question, so, between the ague fits that periodically stole over my frame, I listened. There was something doing that night. The moon behind the mists and sleet was eerie, and Pichincha's black crater-wall almost overshadowed us. The thin and ghostly sides of our tiny tent pulsed with the breeze, and I was vaguely reminded of that weird scene of the Witches' Kitchen, in Macbeth. The futile attempts of my companion a few hours before, to make the evening bean-pot boil, lent color to this fancy. Suddenly I was conscious of a Pentecostal sound, a rushing, mighty, but far distant, blast. It seemed to come from the crater. Could it be an eruption? No, the crater was extinct! And then, just as this thought consoled me, a deep answering growl, like a defiant echo from the cliff above our camp, sent thrills along my spinal marrow. Lemmon seemed to sleep, so I had no companion to this new misery. An interval, a drowse, and then another rehearsal of this unearthly carouse of the cliffs awoke me. Then did I become conscious of notes high-pitched and plaintive, a sort of tiny climax or tintinabulation, coming from the tussock-dotted arena around the camp. In the long hours which marked this dismal chorus I thought a thousand solutions for it. The crater and its possibilities figured in all; the answering growls and roars were those of ranging Mountain Lions on the high slopes and the final treble came, mayhap, from a watchful brown-breasted Flycatcher, *Myiotheretes erythropygus* (Sc.), whose mate I had shot the day before, above the nearby spring. When

we got back to Quito I asked Mr. Söderström to explain it all. The rushing wind he thought might be an Owl or some flying night-bird, possibly a "Woodcock" gyrating, or possibly "one of those Grouse." The Puma-like roars were surely from an Owl, and the minor refrain the chirping, peeping notes of the innocent and timorous Tinamous! What an anti-climax to my tragedy!

Our first morning on the mountain-top dawned gloomily enough, and it was tough work kindling a fire and warming up a bit. While Lemmon fanned the smudge I visited my frozen mouse traps and was cheered not a little by a very good catch of small rodents, an order very poorly represented in the lower altitudes of Ecuador. Near the spring I came across a brown bird whose make up and actions reminded me of a hybrid between a Wheat-ear and a Shore-lark,¹ as it ran about the banks and spray dashed rocks of the pool. It proved to be another member of that strange South American family of Dendrocolaptids. Not long after, as we rose over the ridge that separated us from the final slope to the crater, a few more were seen in company with a larger species, *Upucerthia excelsior* (Scl.), whose color was very similar but whose physique and movements among the sparse grass and heather reminded us of a cross between a Palmer's Thrasher and a Cactus Wren. Both these birds were almost wholly silent, only a sort of low, troubled, warning note escaping them when more sorely pressed by our pursuit.

The general absence of song, or even of voice, among the really abundant bird-life of this sublime region gives one a sort of awesome feeling as he goes popping about the slopes with a puny cane-gun. What are all these birds doing here? They don't seem to be breeding or mating or migrating;— just living, shiftless, without any object in life. Not so, however, the Hummingbirds. The lower half or two thirds of the Paramo is largely destitute of Hummers at this time of year, except as one may be seen to dart swiftly across in its journey to a distant peak. As one nears the snow line, however, and the top of Pichincha peers out at intervals from among the clouds, only 1000 feet above him; the Hill-Stars, *Oreotrochilus pichincha* Bourc., as they are called by Gould, suddenly become abundant. Flowers are far from common in the

¹ Its Dipper-like habits are alluded to in the generic name. It is *Cinclodes fuscus albidiventris* Scl.

Paramo, but, as we near the frost line and the tussock grass dwarfs and disappears, a curious, straggling, prickly, evergreen shrub, the *Chuquiraga insignis* of Humboldt, is found growing in belts and patches and attaining a stature of six or eight feet. It has erect, thistle-shaped flowers of a brownish yellow hue and on these the Pichincha Hill-Stars seemed almost solely to feed. Away from these stony wastes, on the very verge of desolation, they never wander far, though their strength and rapidity of flight is truly wonderful and they seem to be the most restless of a restless family. We secured several specimens and were disappointed to find nearly every one in shabby, moulting plumage. The female Hill-Stars are one of the plainest of their sex in the family, a sort of frosty gray with only a faint tinge of the dorsal green which characterizes nearly all of the Hummingbirds. The males are truly beautiful, their pure white underparts and white, median tail feathers contrasting strongly with the dark wings and purple head and outer tail. The tail is large and used with fine effect in their curvets and airy gambols over the boulder-strewn arenal, down into the quebradas and up into the black, basaltic cliffs that overtop the crater. Gould asserts this species is distinct from the Hill-Star, *Oreotrochilus chimborazo*, which inhabits a like region on Mt. Chimborazo, though that mountain is only 40 miles distant and could be reached by these wonderful aeronauts in as many minutes! What invisible barriers can they be which have set the bounds of such a bird's wanderings? The close resemblance of the two species to each other and to some ancestral type is unmistakable. We are led to think that ancestor must have lived when the lower country, now separating these two mountains, was at an average elevation of 13,500 feet, or rather so elevated that the floral conditions then and there obtaining favored the life of this Hummer. As that region became depressed, the Hummers of the two localities naturally advanced upward along the mountain slopes with the changing flora, and eventually became separated by a lower floral region, unsuited to their needs. After that, local differentiation became not only possible but probable, but it must have covered a period of many thousands of years. In short, just as many an island of the Pacific, due to depression, has been cut off from land affinities it once shared with neighboring islands, resulting in the strangest

isolation and provincialism of certain species of birds, so have the neighboring peaks of the Andes, rising above the semi-tropical ocean of the "Templada," become the refuge of slowly vanishing groups of birds whose very existence depends on an equatorial environment that is elevated about 13,000 feet above the sea.

There are other species of Hummingbirds which venture into the Paramo and even range over the top of Pichincha, but the Hill-Stars outnumber and outgeneral them ten to one. One of these is a dark Thorn-bill, *Ramphomicron stanleyi* Bourc., which feeds in a dainty, topsy-turvy fashion on the alpine crocuses and dwarfed heaths, which, near the snow line, have absolutely no stems but just bloom at the surface of the sand and ash. It is "heels-over-head" with these Hummers and they can take the turn with wonderful grace, seeming to be walking from flower to flower on their bills. Once in the hand, this species displays amazing colors, a beard of ruby fire on the lower throat; the chin metallic green; the long, broad and emarginate tail of a peacock blue! Gould says it is only found *within* the crater of Pichincha. We found it only *outside*, along a narrow gorge, 500 feet below the crater's top. Just as the snow is reached, the sandy crater-slopes are strewn with boulders, and seated on these we here find for the first time a beautiful grayish Flycatcher, *Muscisaxicola alpina* Jard., dark above, nearly white beneath, the size of our Phoebe, darting languidly about after the insects which have dared this thin and frigid atmosphere. Not a sound save a weak and plaintive call escapes them and their presence seems to heighten the mystery of a haunted land. Here, too, is the very exclusive haunt of the whistling, loud-calling "Partridge"¹ of the arenal,—the Crater Partridge it may well be termed, a brownish, sand-colored bird of swift, nervous flight and about the size of a Pigeon.

Hawks are not rare; a black fellow with red legs, the size of our Sharp-shin, often darting around the quebradas after an unwary bird or mouse. The handsome Vulturine Hawk, *Ibycter carunculatus* (Des Murs.), looking and behaving much as our Texan Caracara, was seen about camp in pairs and one was shot by Mr. Lemmon out of the driving mists on the very crater brink of Pi-

¹ Not a Partridge at all, but a seed-eating Plover-snipe, belonging to the *Charadriiformes*; *Attagis chimborazensis* Scl.

chinchu. The ubiquitous Sparrow Hawk also climbs these slopes, and, for all one can see, it is exactly the same as ours of the States.

High over all careened the white ruffed Condors. As many as five could be seen at one time, circling the summit or setting their course directly toward and over us when our shooting became most noisy. Their appearance in flight resembled closely that of the California Vulture, there being more of the Eagle in it than is seen in the gyrations of our Turkey Vulture. No flapping was noted, except a few strokes when shot at, as one flew directly over, about 250 feet above our heads. The flight is very swift, not often in circles but from peak to peak or down over the Paramo, to which region they seem to mostly confine themselves. We never saw them at Rosario, though they are said by Mr. Söderström to breed as low in the cañons as 8,500 feet. Despite their white secondaries and collar, Condors rarely look whitish in flight, the back generally being above the line of vision. I was greatly disappointed in the apparently small size of these birds from an open-air viewpoint. They actually looked no larger, in such magnificent surroundings, than our own poor Buzzards. However, even mountains look small from the Paramo and when one of the great birds bore down upon me, at the report of my gun, and came rushing along about 150 feet overhead, with the tempest in his teeth and his widely distended primaries cutting the air with a sound like a hundred sabres, I was quite impressed. The glancing eye and rapidly turning head, as he made a few circles above me, showed that he also was looking for game, but evidently my anatomy was not to his fancy and he passed grandly on.

HADDONFIELD, N. J.

Feb. 9th, 1912.

NOTES ON WHIP-POOR-WILLS AND OWLS.

BY FRANK BOLLES.

With a Foreword by William Brewster.

EIGHTEEN years have come and gone since Frank Bolles died. It was fittingly said at the time of his death: "Harvard College may get another Secretary but not another Frank Bolles." Equally evident then as now was the fact that precisely the place he filled and the service he rendered as a nature student and writer could never again be made good. For he possessed qualities which in combination — if not severally — were well nigh unique. Although romantic by temperament and gifted with rich imagination he was exceptionally accurate of observation and no less careful of statement, seeing things exactly as they were and afterwards describing them exactly as he had seen them, in language admirably terse, yet so vivid and so picturesque that one could not help wondering at its beauty and effectiveness. Moreover he had it ever at command and was so able to concentrate his thought that some of his most charming and perfectly finished essays were written within the space of an hour or so, in the family sitting room, with half a dozen people close about him talking — he himself perhaps contributing more or less to the general conversation. Unlike most men who have won distinction as field naturalists he took no conscious interest in nature during early boyhood but in 1876, when nineteen years of age and at Dean Academy, Franklin, Massachusetts, he wrote in some notes which Mrs. Bolles still possesses that he was "thoroughly fascinated" with the study of "bird habits and peculiarities." It does not seem to have engaged his serious or at least continued attention, however, until 1884 or 1885 when he set about it with characteristic energy and intelligence, thereafter devoting to it most of the time not required for the performance of professional or family duties. By night as well as by day, at all seasons and in every kind of weather, he was afield in the region about Cambridge or in that accessible from his summer home at Chocorua, New Hampshire — while occasional trips were undertaken to remoter places such as

Cape Breton. Many a man of similar field experience has failed to profit greatly by it; but Frank Bolles was accustomed to so direct and systematize whatever work he had in hand as to make it yield the best possible results and by personal observation chiefly, within a period extending over not more than ten years, he became intimately acquainted with many of our New England birds besides ascertaining facts concerning some of them which had not previously been known to any one. Unfortunately he had scarce begun to draw on this rich store of original information for purposes of publication when his life came prematurely to an end. Nor had he committed much of it to paper in any form, being accustomed to rely largely on a memory so perfect that it rarely failed and never misled him. He left, however, some finished manuscripts which Mrs. Bolles has published since his death in two volumes entitled respectively "From Blomidon to Smoky and Other Papers" and "Chocorua's Tenants"; the latter book consisting of a collection of original poems relating — with a single exception — to familiar birds. There were also a few pages of field notes — written on the backs of printed lists of Harvard Professors which Mrs. Bolles has most kindly placed at my disposal, thereby enabling me to offer them to the editor of 'The Auk' who has accepted them with an eagerness which does credit to his known appreciation of everything especially precious in ornithological literature. Since he proposes to print them as nearly as possible in their original form, and also to reproduce by photographic process a portion of the manuscript with some pen and ink sketches which accompany it, they may safely be left without further word from me, to testify — even more convincingly perhaps than have any of his finished printed essays — to the extraordinary care, precision, patience and intelligence with which Mr. Bolles was accustomed to pursue his field studies of birds. — W. B.

With the Whip-poor-wills.

July 5th. 8.25, on stone heap E. of barn. 8.27, stone W. of well. 8.33, hears other down by lake and disappears instantly. Whip. down by lake about $\frac{3}{4}$ minute later whips very much faster than usual. 8.45 Whip. It whips a few times bet. house and lake.

July 7. 8.35-45. "Quip o rip (or ri)." At 8.20 I went to stone W. of well and hid under the narrow fringe of Spirea bushes, 2½ ft. high only 3 ft. from stone. No wind bright moonlight. I lay flat on my stomach, and shook bushes well over my legs and snarled them over my body. Then resting my chin on my hands and holding my soft brown cap over my mouth and nose I waited. Mosquitoes, flies and midges simply hellish. I suffer torments. I wait 15 minutes. Five pass in utter silence as far as whips. are concerned. Then at 8.25 two begin down by lake, and continue about 5, shifting some. By 8.34 one had got to stone heap by barn. I know he will come to me next and I shake myself, rub off skeets and wait. Suddenly I hear a rather feeble whip, 12 times S. of me, then silence and then a bird flies to the stone in front of my face, coming low over the bushes and lighting with its tail towards me. It squeaks or clicks three times, and I fear it suspects me and is giving a slight alarm note, but the next moment it begins the piercing *quip o' rip* slightly raising its head and dipping its tail each time it makes the sound. The head rises on the *quip* and falls on the *rip*. The wings do not move, nor the body save by slight tipping. I could see the bird's outline perfectly against the white background of the shingled barn on which the moonlight fell fully. It uttered its note about twenty or thirty times when to my astonishment another whip. alighted near it, on the left (W.) end of the boulder. One or two sounds like the soft popping of corn came from the new arrival, and the first bird, which had ceased its call, faced west and began a strange, slow dance, advancing a step at a time towards its mate, raising its body to the full length of its legs at each step, thus making a sort of undulating approach. The other bird remained where it alit, but seemed to be moving its body up and down or else slowly pulsating its wings. The first bird, which I think was the male, seemed to continue its dance entirely around the female. As he passed her, indescribable purring and popping sounds were made and one of the birds flew lightly away. — the ♀ I think. The male resumed his first position, and remained silent. Then he rose and circled in the air, catching an insect I thought, for he came back at once to the spot on the rock which he always covers. A moment later his mate seemed to call from below the house,

near the lake, and he flew, his white feathers flashing as he spread his tail, and the strokes of his wings making a distinct and quite loud sound as he passed close above my head.

July 8. Went out at 8.20. Bird began by barn by 8.25, and remained there five to eight min. Then went further, came back, and not until about 8.40 did he reach my stone. He came very low, made a half circle to the right and alit. No suspicion of me, although this time I had crawled up so that he was within long arm's reach. He began whipping at once and the sound was really deafening I forgot the mosquitoes and midges in listening. My heart beat violently and in my cramped and uncomfortable position I trembled so that the bushes swayed. He minded not. Once I swallowed and made a slight sound in my throat, as my head was jammed back on my shoulders. He stopped instantly and listened. After 50-60 whips he whirled up into the air and then returned, this time a foot farther away from me but facing me. The sound was even more intense and I could see his white throat move. He shifted his head from time to time and the direction of his beak regulated the carrying power of the sound remarkably. As I heard it tonight under the most favorable conditions possible the sound spelled out was *a-crip-o-ri*. The "a" being the cluck. The last note is open. Watched very closely there proved to be very little motion in the head, tail or body — considering the violence of the sound. No reply came to the whipping and no visitor. So after about seven to 10 minutes, probably less, my bird flew away, after an interval of silence. He went to the stones near the brook, and I followed to locate him. He went but later came back about 9.30, and his mate came too, as their extraordinary purring attested. He also went back to my stone, showing thereby no fear or suspicion. It was a strange feeling to be so near a living bird singing such a strange song, at night. Wind N. N. W. Moon full and perfectly clear. About four other whips audible. Remarkable regularity in time, place, attitude. An odd character all round.

July 9. Took my place at 8.20. Bird came about 8.30 after having been by barn as usual. He flies just over top of fence, slightly rises, wheels and faces the way from which he came. He began whipping without prelude and whips about 50 times, all

the while keeping his head moving now to right, now to left. Then he was silent. While he whipped his mouth seemed to open and shut with each whip. It was light enough for me to feel quite sure of this at first. His silence was broken by a sound which I thought was not connected with him. It was a sort of low snoring reminding me slightly of the dry sound produced by rubbing one's thumb over a smooth piece of wood, or the inside of the closed forefinger. He made this sound three times, and a second later said "whip" sharply once. He was answered by a similar single note from the fence or wall a few paces away, and with a flash of his white spots he was gone. He said "whip" once or twice on or near the fence, and then went further. From the fence I was much more likely to be seen than from any other quarter, and I think his mate refused to join him on the rock owing to my dark presence. I was near enough to him while he was whipping to have reached out my hand and touched the spot on which he stood.

As the bird sits flat on the rock its wings show their tips clearly over the tail.

Once later before I stirred, he came into the dooryard and sang cheerfully from the woodpile or the kitchen steps — an unusual proceeding.

Aug. 9. Every night thus far the whips. have sung, and I heard them this a. m. at 4 o'clock. For a month my whip. has not been on his rock to sing. Once about July 30 I heard him purring there at 8.30 p. m. Last night while I was eating a late sup. after being at Heron Pond till 7.30 I heard one say "whip" either on or just beyond the back piazza. Six were audible at Heron Pond about 7 p. m., one on the shore. As a rule, but with marked exceptions, they say whip-poor-will on three or four times running instead of 60-100 or 150 as a month ago. Full moon makes no apparent difference.

Aug. 29. Have heard no whips. since Aug. 21, a. m. Aug. 29, heard them this evening.

Sept. 4. Whips. going a while each evening.

Sept. 11, 12, 13. Whips. going on the stone. Several times 3 nights running.

Sept. 21, 22. Whip. around barn, on bracket on roof, clucks

3. Whif-pow-rill The one alarmed by a similar single note from the fence or wall a few paces away, or with a flash of his white spots becomes gone. He said 'Whif' once or twice one or near the fence, then went further. From the fence I was much more likely to be seen than from any other quarter & I think his note referred to join him on the rock rising to my back presence. I was near enough to him while he was whif-pow to have reached out my hand & touched the spot which he stood.

As the bird sits flat on the rock it sings and this helps clearly over the tail



Once later before I stirred, he came into the doorway & sang cheerfully from the woodpile or the kitchen steps — an unusual proceeding.



Aug. 9

Every night thus far the whif's have sung. I heard them this a.m. at 4 o'clock for a month. My whif has not been on his rock to sing since about July 30. I heard him jumping there at 5 p.m. Last night while I was eating a late soup, after being at Hiram Pond till 7.30 I heard one say "Whif" either on or just beyond the back piazza. Six were audible at Hiram Pond about 7 p.m. one on the shore.

As a rule, but with marked exceptions, they say whif-pow-rill on three or four times, at running instead of 60-100- or 150 as a month ago. Full moon makes no apparent difference.

Aug. 29. Then heard no whif since Aug 21. a.m. Aug. 29. Heard them this evening

Sept. 4. Whif's, going a while each evening.

Sept. 11-12-13 Whif's going on the stone. Several times 3 nights running

when I "whip." Flies near his stone, clucks in the woods,—flops into cherry tree. Have heard no full song for several days.

23. Several full song many times, 6.30 p. m.

Owl Notes.

I wrote my article for 'The Auk'¹ late in December, and early in January. The owls have not bathed much during the winter perhaps because I have not been regular in giving them fresh water. Fluffy ate nothing, so far as I could ascertain between Dec. 15 and Feb. 1. About this time I began to make efforts to vary their diet. I gave up kidneys and gave them mice, grouse wings and heads, a rabbit and fish heads. Fluffy was won over by mice into open eating. Early in February I enlarged their space by making a wire room outside their closet. About three weeks later I gave them half the cellar enclosed in wire netting and built them a hollow tree of barrels. It was about February 10 that I noticed their gathering of material in one corner of a shelf in their closet. Feathers, cotton batting, and dry leaves were placed in a flat layer over the board. It is now March 16, and I am satisfied that they keep constant watch of this place. They remove any additional material which I place near the flat bed. Just about a week ago I began giving them eggshells and eggs. During the week they have eaten the shells of nearly two dozen eggs. For example, this morning I gave them the shells of six eggs covered with the contents of one store egg. Both owls were hungry and they went for the dish in haste. Every considerable part of shell, membrane and yolk etc. was eaten within ten minutes. The taste of the fresh egg pleases them greatly and they crackle the shell in their beaks with evident enjoyment. Fluffy is expert in catching mice or grouse wings thrown into the air. Both birds have fully regained their appetite. A large haddock head is devoured in 48 hours, practically nothing is left of it, except the two largest bones and not always those. I am feeding them light. This week they have had five mice, one fish head, two eggs and the mass of egg shells. They no longer show much interest in the cat when she walks about the cellar floor outside their pen. About a week ago both birds got out through a corner of the wire netting next the floor. I do not

¹ Cf. 'The Auk,' 1890, pp. 101-114.

understand their finding the place. One might have but why both? They have been restless during the early evening for 6-8 weeks or more. I can tell now when they fly about much, because their roosts jar the wire netting when struck in alighting. Once each evening they or one of them hoots or crows. Tonight (16 March) it was at 6.40. Last evening it was 6.55. For many nights it seemed to be at about 8.15 to 9. Later they are perfectly still. Puffy bathed today the second time this week. I had just given them fresh water. I do not note any interest in the barrel tree, although they spend much time in that corner, back of the furnace.

March 5, 1891. It is nearly a year since I wrote the above and I am ashamed that I have not kept better notes of what I have done with my pets. The summer was not one of much activity. My family went to Chocorua April 29, and I followed them finally July 4, or 6, I forget which, I overworked the last few weeks and was far from feeling well all summer. I spent much time in July and early August in watching Sapsuckers, and later L. and I spent ten days at Mt Desert with the Eliots. I was called back to my desk about September 18, and the family came home about October 1. I was laid up with a dislocated ankle. After my writing the March notes last spring the owls did nothing marked. They scattered their nest materials and forgot them. They moulted freely and feathered out finely later in the summer. My notes about Scops are noted elsewhere also about the three young Scops. I tried Puffy on Nighthawk, Whippoorwill, Sandpiper, Woodcock, Hummingbird, Kingfisher, Red-tailed Hawk, Blue-headed Vireos, Barred Owls, Water-thrush, Chewinks, Flock of Blue Jays, large flock of Crows, on Plovers, Loon, the Scops, Snowy Owl; with various results. By way of new food I gave them earth worms in quantities, fresh water mussels which they ate greedily. Snakes of various kinds of which they used to be in terror and which they ate freely, sometimes doubled and squirming alive. They continued to catch live perch and breem, Chipmonks and mice. Puffy caught Chipmonks most successfully. Fluffy was n. g. with them. I used Fluffy all summer and once or twice took out both together. A tap on Fluffy's head at Heron Pond nearly killed him. The skull is awfully thin. I never punish them since that.

Mr. E. C. Mason brought me little Scops on the evening of Thursday April 17. He brought him in a basket in which he had been confined for a day or two. He was captured in Arlington on the 15th. He was sitting in the mouth of a hollow in a tree, and looked like a dead stick poked into the hole. Mason said he was motionless but suddenly fell into the hole as a stick would slip in — without a wiggle. He did not offer to bite Mason. Mason brought him to me about 8, p. m.; I brought up Puffy and Fluffy to the library and then let out Scops who flew about. At first Puffy and Fluffy only watched him with curiosity but later Fluffy did his best to catch him, dodging and circling over the gas jet. I took the big owls away and stroked Scops freely. That night he spent in the back cellar. The next morning he flew against the netting of Fluffy's cage and Fluffy struck for him full force. Scops let go and flew back or Fluffy would have clinched him through the wires. I at once saw plainly that they could not live together, so Scops was taken up to Olive's room and left in possession. Friday he ate nothing. On Saturday morning he had eaten some meat, scraps of chicken entrails, and had drunk. He permits the freest possible handling, caressing etc. Will sometimes hang head downward by his feet — as though dead — or lie on his back in the palm of my hand with eyes closed and no visible motion. On Saturday morning I dragged a dead mouse across his floor by a thread and he pounced instantly and crushed the nape of the neck, pulled off pieces there, then severed the head and swallowed it and then swallowed the whole body. Sunday he did the same. The next day he saw me bring in a mouse and pounced on it almost as soon as it touched the floor. Monday 2 p. m. I caught a sparrow in my box trap but he took no notice of it until night although it flew by him again and again for hours. After 10 p. m., I shut him up in a closet with the sparrow and in the morning he had eaten all but a small lot of feathers, some stiff, some soft. Tuesday I gave him nothing. Wednesday a. m. I gave him a dead robin. He began by eating the right eye and then tearing away scraps from around the wound.

Thursday or Friday I found him dead. Mason after dissection concurred in my theory that he died from injury to the brain due to beating his head against a wire netting at the window.

In June or May sometime Batchelder sent me three young Screech Owls. I sent them up to Chocorua. They were grey and lovely but with awful tempers and harsh voices. Two were later returned to him, and again sent up to Crowlands. They had lost their good feeling toward the one left with me and abused him somewhat, shunned him always. At last, late in August I think it was, I found him dead and *plucked* in the cage. A week or two later I put the survivors into a barrel with a live mouse. Neither caught it. They quarreled and the next morning one of them was dead and partly plucked. The day following the other died. I clipped all of their wings and took out the one not returned to Batchelder several times. He drew birds if they saw him but he often made a stump of himself and evaded observation. They were fond of small birds, mice, fish, and so-so of liver.

THE RELATION OF GENERA TO FAUNAL AREAS.

BY SPENCER TROTTER, SWARTHMORE COLLEGE, PENNSYLVANIA.

THE relative antiquity of a genus is probably indicated by the greater or less departure of its several species and their varietal forms from a common ancestral type. The degree of departure may be the resultant of two opposing factors — first, the influence of conditions favoring segregation, as the character of the vegetation and the variety of habitat within the breeding range, and, secondly, the opposing factor, that of the inherent quality of resistance in the common ancestral type against the disrupting influences of environment and of variational tendencies. It is in the breeding ground or faunal area that we must look for the conditions which produce these changes in epidermal tissue and those minor departures in voice and habits that we recognize as constituting distinctive specific and varietal differences within a genus. These influences are operative in the breeding area at the period of greatest plasticity of the organism, and variations from

the common type thus produced would tend to become more firmly set in the new form through geographical or habitat isolation in the breeding season. During an extended period of time this differentiation would tend toward an equilibrium as the inherited characters strike a balance with the environment. Time, and the segregating influence of wide geographical areas, with their opportunity for varied climatic and vegetation habitats, appear as the responsible causes of the phenomenon of species and of species distribution.

This is so well-worn a theme that I must ask your pardon for bringing it forward. It seems to me worth while, however, to recall these underlying principles. It is a habit of mind to regard a species as very definitely related to its range. It is much more definitely related to its habitat. By this I mean that a species is much more likely to extend its range than to alter its habitat. And further, I feel convinced that temperature *per se* does not effect the sexual tissues of a species so profoundly as to set barriers to its breeding area. Temperature, rainfall, soil conditions, and topography affect the character of vegetation and this is apparently the most direct and dominant factor in the distribution of species.

In a paper read before the Delaware Valley Ornithological Club and published in 'The Auk' for July, 1909¹ I have stated my belief that the present geographical groups of species which we recognize as faunas are more or less temporary phases in a general northward spread of species during post-glacial times, and that the true interpretation of faunas is not to be found in any single condition, such as temperature, but is related to the geological history of a land. In the present paper I wish to bring forward the thought that in this very advance or northward spread we have the conditions which have broken an original common type into several varietal and specific forms.

Let us take, for example, the genus *Hylocichla*, a group of woodland Thrushes quite similar to one another, presenting, one might say, a minimum of departure from an ideal type, both in adult sexual and juvenal phases of plumage. It seems quite possible that a generalized ancestral form common to all may have existed

¹ The Geological and Geographical Relations of the Land-Bird Fauna of North-Eastern America, pp. 221-233.

during the Middle Pleistocene in a more or less restricted area south of the glaciers, and that in spreading northward after the melting of the ice sheet, certain individuals reached farther to the north than others, establishing breeding grounds in comparatively high latitudes. This ancestral type was undoubtedly one of the many species that characterized the forest fauna of the Pleistocene and spread northward with the spread of this forest during what geologists term the Glacio-Lacustrine sub-stage. The instinct to return to this northerly nesting area at each succeeding spring would become a fixed habit through inheritance, and this group of individuals, removed by its position from the swamping effects of intercrossing, would tend to hold any variations that developed by segregation, the inherent quality of resistance against disruption determining the degree of change. The specific forms we recognize as *Hylocichla aliciae*, *H. ustulata*, and *H. guttata*, with their several varieties, are thus the more closely related northerly-breeding species, the nesting grounds of which now overlap one another, though the Gray-cheeked Thrush has advanced beyond the limits of the other two, quite to the tree-line, while the Olive-backed Thrush has spread somewhat beyond the breeding range of the Hermit. In these two last species I have observed in Nova Scotia a marked difference in habitat. The Olive-backed Thrush was invariably found during the breeding season in the tall and heavy growth of coniferous woods, while the Hermit Thrush frequented, almost entirely, the lighter, scattered growth, being especially abundant in burned-over tracts and in sprout-lands of birch. In limited areas their nesting sites did not coincide and this habitat difference may have been responsible in the fixing of their specific characteristics by segregation.

These remarks on the Genus *Hylocichla* apply mainly to the eastern phase of distribution. In the Cordilleran region and on the Pacific slope the varied conditions of mountain topography have more profoundly disturbed the several types which have broken up into a number of varietal forms. On the eastern side of the continent we find a variety of *Hylocichla aliciae* — the Bicknell's Thrush — occupying quite isolated areas during the breeding season. *Hylocichla fuscescens*, the Veery, is of a more southerly breeding range than any of the foregoing species, while

the Wood Thrush, *H. mustelina*, has not advanced beyond the Transition Zone.

The Genus *Dendroica* of the Mniotiltidæ presents the antithesis of this close likeness of specific forms. We have here a group of thirty-four species that are widely different from one another in color pattern and with breeding ranges, in many cases, coterminous, or at least markedly overlapping. A geographical analysis of the genus shows that the species fall into two equal numerical groups. One group of seventeen well-defined forms has a strictly northern breeding range as compared with another group of seventeen species that is mainly extra-limital, breeding in the sub-tropical or the tropical domain, certain forms being confined to insular areas in the Caribbean. Four species of this second group have forms that breed in the North American region, namely *D. æstiva*, *D. auduboni*, *D. gracia*, and *D. vigorsi*. Of the first group of seventeen strictly North American species only three are limited to the western side of the continent — *D. nigrescens*, *D. townsendi*, and *D. occidentalis*, the remaining fourteen being highly characteristic of the eastern fauna.

Taking into account the large numerical element in this genus and the great variety displayed by its forms, together with the fact that one half of the recognized species are still confined to the tropical or sub-tropical area, there seems some evidence for believing that this group of birds is of considerable antiquity and that its area of characterization was somewhere in the Middle American region of tropical environment, possibly at a time when the Tertiary land borders of the Gulf and Caribbean were much more extensive than at present and when certain of the now island masses were more closely connected with the main continental land. With the disappearance of glaciers from the northern region certain primitive types spread northward, and I think we may recognize the vanguard of this movement in such species as *D. striata*, *D. castanea*, *D. palmarum*, *D. townsendi*, *D. magnolia*, *D. tigrina*, *D. æstiva* and *D. coronata*. All of these forms reach a high northern latitude in the breeding season and some like the Black-poll and Palm Warblers, the Myrtle and Magnolia Warblers have been lured far into the Northwest, indeed quite to the Sub-Arctic, by the great stretch of coniferous forest. The wide overlap observed in the

breeding area of these species would seem to indicate, as in the case of the Thrushes above cited, a slow movement of one species upon the heels of another, overtaking one another in their gradual spread, and it is probable that the initial movement was made up of a less number of forms than is represented by the existing species.

The distribution of color has considerable significance as an indication of descent. The almost universal presence of white blotches on the tail feathers among the species of *Dendroica* and the presence of wing bars must have been the fundamental color marks of the common ancestral type. And it seems to me, further, that certain primitive varieties of this common ancestor are indicated by the greater likeness among some of the existing species. The similarity of such species as *striata* and *castanea* in the autumnal phase of plumage, and the streaky, brownish young of *coronata*, *tigrina*, and *palmarum*; the head patch common to some forms, the throat patch common to others in the adult plumage, the rump spot and other markings, are very evident features of some community of descent.

All this, however, is not to the point or purpose of the present paper. What I wish to show here is that a genus like *Dendroica* possesses evidence in the large number of its specific and varietal forms and in their wide extra-limital distribution of a disruption of some tropical or sub-tropical ancestral type at a remote time compared with such a genus as *Hylocichla*. Geologically we might express this by saying that the primitive specific types of *Dendroica* were of late Tertiary origin, whilst the *Hylocichline* type was broken up into specific forms during the Pleistocene. Birds have their geological history as well as do mammals and other forms of life and as we have not been able so far to find their fossil remains we must look for traces of this history in the specific characters and in the facts of geographical distribution.

Professor Osborne has cited the case of a mammoth¹ in the stomach of which were found the remains of flowering plants and grasses belonging to species that are still growing in northern meadows. Conservative estimates as to the time when this animal lived would carry us back some twenty-five or thirty

¹ Osborne — "The Age of Mammals," page 420.

thousand years. It is probable that many existing species of birds frequented these ancient meadows and the encroaching woodlands of birch, alder and conifer. If not the identical species then at least a very near and closely similar parent form that had split off from a still more remote parental stock.

I have taken the genus *Hylocichla* and the genus *Dendroica* as presenting very wide contrasts in the number of specific forms and in degree of likeness. Any genus of land birds that we will analyze must reveal some features that point to its history in connection with the origin and distribution of its several species and their varieties. If a genus stands for anything it must stand for this origin of its several species from a common ancestral type, near or remote. If the distribution of a genus means anything it means the history of its species in relation to changes through environment and the fixation of characters by segregation. Overlap or coterminous breeding range is the logical sequence of the spread of a species or variety into the territory of another, either after the one in advance has become fixed or in habitat differentiation if advancing at the same time. The Transition Zone Fauna is a wide expression of this overlap and is a clear indication of the advance of types toward the north. It is not, however, a permanent expression, nor is any faunal area permanent. Viewed in the immense lapse of time it is a momentary glimpse of an endless biograph. I am constantly interested in reading items in the pages of 'The Auk' that refer to some species of bird observed in a locality to the north of its general breeding range.

In conclusion let me sum up the somewhat rambling matter of this paper in the following brief statements:—

(1) — The genus means an ancestral type that has split up into its present component of species and their varieties under the influences of geographic and habitat environment.

(2) — The forms thus divided become fixed through segregation in the breeding area either through difference of habitat or by extension of range.

(3) — Each original type must have possessed, and its descendants probably still possess, a certain greater or less resistance to disruption. A genus represented by a single species, or at most by a very small number, would seem to indicate a high degree of resistance, even though spread over a widely varied territory.

(4) — The greater antiquity of one genus as compared with another would seem to be indicated by the larger number of its species and their wider variation from one another, but this might be offset by a greater resistance against disruption so that the genus represented by only one species might be, in reality, quite as ancient as the numerically high one. Furthermore we cannot know how many forms may have died out in any genus.

(5) — A genus is definitely related to a geographical range, while its several species are more definitely related to habitat conditions within the range, especially the breeding area.

(6) — A fauna is an expression of the temporary adjustment of any group of living beings to given conditions of environment. No single factor conditions its components or its boundaries. In the sum of its conditioning factors character of vegetation is probably the most important determining influence. Unquestionably the changes which man has wrought upon the face of the country by the clearing of forests and the development of agriculture has profoundly influenced the distribution of many species of birds.

(7) — All species tend to spread, as their ancestral types have spread, wherever suitable habitats are accessible to them. Search for food, especially at the breeding season, is the motive. Heredity has fixed the migratory impulse. The long daylight of the northern summer has probably had a determining influence in the northward spread of ancient generic types and of their descendant species.¹

¹ E. A. Schäfer, F. R. S. On the Incidence of Daylight as a Determining Factor in Bird Migration. *Nature*, Dec. 19th, 1907.

NOTES ON THE LAYSAN FINCH.

BY HUBERT LYMAN CLARK.

SOME time ago, Dr. W. K. Fisher kindly gave me an alcoholic specimen of the Laysan Finch, *Telespiza cantans* Wils., with the suggestion that I examine its pterylosis, comparing it with that of some of its Hawaiian allies as described by Gadow (in Wilson and Evans' *Aves Hawaiienses*, pp. 219-249). Since *Telespiza*, however, is one of the very few genera of endemic Hawaiian birds which Gadow had no opportunity to examine, it seemed desirable to examine some of the other features of its anatomy and thus make my notes a sort of addendum to Gadow's work. The relationship of *Telespiza* to *Loxioides*, *Psittirostra* and *Rhodacanthis* is so evident that it would be surprising if my investigation threw any new light on the connection between these birds and the other Passeres. I have however compared my Laysan finch in each character examined with a Chewink, *Pipilo erythrophthalmus*, not because of any possible relationship between the two, but because the chewink is a ground-loving finch not altogether unlike *Telespiza* in its habits. I will take up the different points examined in the order adopted by Gadow in his account of *Loxioides*.

Bill. Gadow says that the bill of *Loxioides* is "like that of typical Conirostres and clearly Fringilline, without notches." In *Telespiza*, the bill seems to be very similar to that of *Loxioides*, but I am not sure that it is clearly Fringilline. It is not very similar to that of *Pipilo* nor to those of several other American finches with which I have compared it. Its most marked peculiarities, in addition to the absence of notches, are the very straight commissural line with hardly a trace of being bent downwards at the inner end and the markedly incurved or inrolled tomia, which do not appear to form any cutting edge against the upper mandible.

Nostrils. The character of the nostrils is one of the most marked differences between *Telespiza* and *Pipilo* or any other Fringilline birds with which I have compared it. The openings are large but each is provided above and on the posterior margin with a piece of thick bare skin, apparently corresponding to the opercular fold of many Hawaiian birds. A similar fold, less conspicuous because

narrower and sloping inwards, is present on the lower margin also. So far as I can understand from Gadow's description (l. c., p. 246) this arrangement is very much like that found in *Rhodacanthis* and *Chloridops*. It is less like that found in *Psittirostra* and seems to be noticeably different from what is shown by *Lorioides*. It seems probable that Rothschild's description of the nostrils in *Telospiza* (Avifauna of Laysan, p. 196) was made from a dried specimen, for it does not accord with what alcoholic material shows. It may be that in life the nostrils can be quite closed by the movement of the bare surrounding skin.

Tongue. In *Telospiza*, although the tongue resembles that of *Lorioides*, the vertical thickness and fleshiness are remarkable. The tongue proper is 11 mm. long, scarcely 2 mm. wide and about 2.5 mm. in vertical thickness. The fleshy surface is quite papillose and the tip is not divided but is finely fringed as in *Lorioides*. As compared with *Pipilo*, *Telospiza* has a much larger, thicker, fleshier and blunter tongue.

Pteryllaxis.—The resemblance between *Telospiza* and *Pipilo* in the general pteryllaxis is so striking as to be remarkable. The head is very fully feathered and has no apteria; above the eye there is more or less evidence of longitudinal rows in the arrangement of the feathers. The upper cervical tract is narrow and well defined and is continuous with the dorsal tract, which is characterized by a rhombic saddle of good size. The femoral tracts are narrow, about 10 mm. long and perfectly defined. The lower cervical tract forks well up on the throat and each branch connects very evidently over the shoulder with the narrow humeral tract. The sternal tracts are moderately wide and are slightly but distinctly separated posteriorly from the ventrals, which are moderately broad and end some distance anterior to the anus. In *Telospiza*, a narrow but quite distinct branch of the sternal tract runs directly upward on the side of the body under the wing for 6-8 mm., at right angles to the main tract; it contains 10-12 feathers. Indications of this tract are present in *Pipilo* but Gadow does not refer to its occurrence in any of the Hawaiian birds examined by him. Possibly its definiteness in *Telospiza* is associated with the ground-loving habits of the bird. While there are only nine primaries in *Pipilo*, there are ten in *Telospiza*, the tenth being short and apparently non-functional; the longer primaries had all been cut in my

specimen, so that I can say nothing as to their relative length. There are nine secondaries in one wing but there seem to be ten in the other; the wing is quintocubital. There are twelve rectrices. While the resemblance to *Pipilo* is marked, except in the number of the primaries, it should be noted that the differences in pterylosis between *Telespiza* and *Loxioides* or *Psittirostra* are trivial and of no significance.

Metatarsus.—The covering of the leg in *Telespiza* is so nearly like that of *Loxioides*, as given by Gadow, that no further description is necessary.

Alimentary canal.—Here again the resemblance to *Loxioides* is so great, no detailed account is worth while. As the bird had been kept in captivity several weeks, the contents of the stomach are of no importance. The crop-like dilatation of the lower end of the œsophagus is marked but there is no real crop. The intestine is about 250 mm. long and is very narrow, its convolutions resembling those of *Loxioides* so closely, that Gadow's figure would do for either bird.

Palatine region.—The bony palate of *Telespiza*, so far as could be determined without a thorough cleaning, resembles that of *Loxioides*, as figured by Gadow, but differs in having a longer interpalatine bone, so that the anterior ends of the pterygoids are separated from the posterior ends of the palatines by a space of 2 or 3 mm.

It is fair to conclude from the sum of these characters that *Telespiza* is, as has generally been supposed, closely related to *Loxioides*, and except for the nostrils, it is more like that genus than any other. In view of the restricted distribution of *Loxioides* and the much wider range of *Psittirostra*, one would naturally have expected the latter to be the nearest ally of *Telespiza*. However as the three genera have, together with *Rhodacanthis*, almost certainly come from a single stock, the failure of the evidence to fulfil this expectation is of no significance.

Finally, I cannot refrain from expressing the opinion, based on the study of Gadow's results in connection with these observations on *Telespiza*, that the apparent resemblance to the Fringillidæ is superficial, and that those ornithologists are correct who look elsewhere for the ancestry of the fringilliform birds of the Hawaiian Islands.

A LAST WORD ON THE PASSENGER PIGEON.

C. F. HODGE, CLARK UNIVERSITY, WORCESTER, MASS.

THE question with which we started out two years ago was: Has scientifically adequate search of North America been made for *Ectopistes migratorius*? The answer then was that such a search had not been made. A year ago the fact that no nestings had been discovered and that not a single feather of evidence had been sent in seemed practically to prove that the species was extinct. However, since no definite time limits had been set for the rewards, and since a number of apparently encouraging reports had been received, we were impelled to continue the investigation.

During the season of 1911 satisfactory and practically general publicity had been secured through the educational, agricultural and sporting press. Professor Lockhead has also continued his coöperation for Canada through this season. The final result is: No nestings reported, and there are no undecided cases and no disputes. The slate is clean. None of the rewards were claimed, and, as announced in all published, official statements, all offers of reward terminated Oct. 31.

Many false reports were received, but all except four of these were settled by correspondence. In nearly every such case my informant would describe two eggs or squabs in the nest. It was only necessary to forward a reprint with the late Professor Whitman's emphatic statement that the Passenger Pigeon never laid but one egg — containing also cuts from the excellent photographs recently furnished by the American Museum of Natural History of the eggs and adults of both Pigeon and Mourning Dove — to induce the people to acknowledge that their birds were Doves.

One case, investigated by myself early in May, is deserving of permanent record. My informants reported a flock of ten pairs or more nesting in a grove of evergreen trees, thirty to thirty-five feet from the ground. They could not be induced to tell how many eggs or squabs were in the nests. I found the evergreen trees to be three clumps of large Norway spruces in a farm door-yard. The house stood on a slight elevation in a valley, devoid for the

most part of trees. The case was evidently one of crowding a number of pairs of Mourning Doves into a small, preferred island of nesting sites. Reasons for unusual elevation were also patent. A number of cats were in evidence and the lower branches of the spruce trees drooped so badly that the birds were forced to choose the higher branches. I circled the place and found practically all the Doves, and climbed the trees and examined a number of the nests. There was no evidence of any Pigeons mingled with the Doves in the locality. This report came from Pleasant Valley, New York.

The three other reports which required inspection were investigated by Professor I. N. Mitchell of Milwaukee, who generously donated his time in making the trips. His first journey was to, possibly, the most likely spot on the continent — northeastern Wisconsin. The informant, Mr. Ben Fagg, had seen Pigeons in or near a large black ash swamp. With Mr. Mitchell he attempted to relocate the birds, but the region proved too difficult and the hunt was abandoned. Mr. Fagg insisted on paying the \$5 forfeit, and it was received, but with the understanding that it would be returned, if he could show us Pigeons there later. A portion of Mr. Fagg's letter is cited below in another connection.

In response to insistent reports — informant had lived in Michigan all his life, knew the birds intimately, had located a flock of from 300 to 500, a number of which came to his barnyard daily for salt, etc. etc. — Mr. Mitchell twice visited this man in southwestern Michigan, but could find absolutely nothing but a few Mourning Doves in the neighborhood. The man offered to forfeit not only \$5 but \$10, if he was mistaken in the birds, but when the time came to pay he "*did n't have the money.*"

This concludes all there is to say on the search for nesting Pigeons during the season. My best acknowledgments are due to Colonel Anthony R. Kuser and all those who followed his lead in continuing their offers of rewards for the past season. With the plan as projected two years ago there is no fault to find. It has worked admirably in awakening the country to the problem, and this awakening can, and doubtless will, be utilized in saving other species which are in present danger. It might be in order to suggest in this connection that a committee be appointed which

shall, in coöperation with the Biological Survey, be requested to prepare for discussion at each annual meeting an authoritative statement concerning the American species which are in danger of extermination. Is it not high time that the American Ornithologists' Union take a strong, leading part in presenting to the country problems in this important field?

A number of reports, a few of them seemingly of great probability, indicate that straggling single Pigeons and even small flocks have been sighted during 1911.

Professor J. H. Moore writes from Chicago, July 14, 1911.

"I have seen this bird on two different mornings since July 4, and have taken out grains and other foods and put them near where the bird was seen. I have, however, not seen it for several days now. This bird was also observed by another gentleman of Chicago to whom I told the exact location of the bird — a man who has seen thousands of them wild. There is no doubt of the identity of the bird, as I studied it very carefully the second time I saw it." From letter forwarded by W. C. McAtee.

Cottage Grove, Wis.

Mr. John E. Mellish reports that he studied for an hour, during a rain, a "large bird" which came from the south about 10 a. m., Apr. 13. It later flew north. He examined it at a distance of 60 feet with a 3 inch telescope with a power of fifty diameters, which revealed every marking distinctly. There was "not a single speck of dark under the ear or on the side of the head in any place." From a letter forwarded by Prof. I. N. Mitchell, whose acquaintance with Mr. Mellish leaves him in no doubt that he saw a passenger pigeon.

Paul J. Sisson, Seneca Falls, N. Y., writes, Sept. 12, 1911.

"I saw a single tame passenger pigeon on Sept. 9 at 1 o'clock in the afternoon, in an apple tree in our orchard. The bird flew direct south."

Mr. James Finch, of Abolon, Michigan, under date of June 1, 1911, describes what he believes to have been a nesting roost of a flock of nearly 500 Pigeons "in a piece of woods by the river" on his farm. This refers to season of 1910. He writes

"We did not notice the birds until sometime in July and soon after harvest we noticed them flying from the river and woods to a wheat stubble about half mile away. 50 or 60 years ago pigeons were very plenty on the same fields. They came then in flocks and all together and these birds came in a flock and went away all at once. Their departure was about the middle of September. They acted so much like the old wild pigeons

that we took for granted that they were the old pigeons.... The boys on the farm killed a few and had them in the pot before I knew it. I never heard of mourning doves going in such large flocks, 800 to 1,000. (This was in the fall when there were many young pigeons.) I presume the birds will be back here next season and I assure you we will investigate them."

James Finch (83 years old).

There is no reason to suppose that this widely migratory species would return to any particular locality to nest, and I have not heard from Mr. Finch again. I was unable to secure any feathers by which to identify the birds which were killed.

From another letter dated Apr. 3, 1911: Arcadia, Ind.

"On March 28th last about 100 passenger pigeons were seen to pass over my father and I about 50 feet above our heads. My father having seen them by the thousands several years ago can firmly swear that they were passenger pigeons. They came from the southwest and were last seen flying northeast. (The time was given in a subsequent letter as 3 P. M.)

"We live in Hamilton Co. about 28 miles north of Indianapolis."

(signed) Harry Noble.

The following is quoted from a copy of a letter forwarded to me by Dr. A. K. Fisher.

Davidson, Mich., May 30, 1911.

"It may be of interest to you to know that I saw a flight of between 50 and 100 wild pigeons — the so called passenger pigeon — *E. migratoris*, I think you scientists name them.

I was in the Northeast corner of Burton Township, Genesee County, Michigan, at the time. A small boy with me cried out "O see the geese, no ducks." I looked up and there they were, less than 300 feet over head, in the irregular constantly shifting formation, I remember so well. I saw millions of them when a boy, tens of thousands of flocks and shot not a few. There can be no mistaking them. They flew swiftly, almost due north while over head, but shifting westward at short intervals and disappeared flying almost due northwest.

I have not seen one before in more than forty years as nearly as I can recall."

(Signed) Ernest Hollenbeck.

Mr. Ben Fagg finds the Pigeons after he failed to show them to Mr. Mitchell and writes him as follows:

Algoma, Wis., Sept. 23, 1911.

Prof. I. N. Mitchell,
Milwaukee, Wis.

Dear Professor: Pardon for delay in reply to your letter of Aug. 14. Had relinquished my position on the Record for the sole purpose of looking

after the pigeons and waited until I had something satisfactory to write you. Following is the result of my observations and experiences.

Could not get a glimpse of the birds until last week, when they came out of the deep woods, in small flocks to feed in the fields as usual just before migrating. In the meantime I had gathered all the data possible from people who had seen them during the past two years.

As rewards are about to expire and there was danger of the search being given up entirely, I carried a shotgun with me to wound and capture or kill one just to prove absolutely that they make their summer home in this locality.

At about 8 o'clock on the morning of the 23d inst., while in the same locality that you and I visited and at the spot where I had seen that young one, I saw a full-grown male pigeon strutting along upon the road, in plain view and within easy shooting distance. It was such a fine bird I did not shoot but stood gazing at it until it flew away. Am satisfied that in the immediate vicinity is to be found the nesting place. Later in the day I saw a small flock whizzing across the fields, but although I chased nearly all forenoon, I could not get near them.

(Mr. Fagg then gives a list of several persons who have seen the pigeons during this season and last.)

"At Gregor, a couple of weeks ago a passenger pigeon was shot and killed. It was cooked and eaten before the diners discovered what a rare bird they had partaken of. From description obtained, I am sure that the bird was a true *Ectopistes migratorius* Linn.... By the time that they return in the spring proper measures should have been taken for their protection. Altho the nests have not been discovered, there is ample proof that they summer in this big swamp and vicinity."

Very truly yours,

Benn Fagg.

A final letter contributed by Mr. Chapman is interesting as indicating how many Pigeons a man in a most likely locality has claimed to have observed during the past 19 years.

Mr. Frank M. Chapman, Editor Bird Lore.

Dear Sir:

In the last issue of Bird Lore I noticed two items in regard to the extinction of the wild pigeon. I saw one wild pigeon at Gulliver, Schoolcraft Co., Michigan about 1892. Again at the same place, one came into my yard, where I watched it from a distance of a few feet for several minutes; the time being May, 1903. At Newberry, Luce Co., Michigan I saw one wild pigeon on each of the days Oct. 13 and Oct. 24, 1909, I saw a small flock June 9, 1910 at Newberry. On two other occasions I have seen birds which may have been and probably were pigeons but owing to unfavorable conditions of observation I am unable to identify the birds with certainty.

Yours truly, Ralph Beebe, Newberry, Mich.

Jan. 9, 1911.

Do such letters constitute sufficient warrant for continuing the investigation a third season? The correspondence for the season will not be complete until, probably, Jan. 1. If decisive evidence does come in, that the species still survives anywhere it may determine future action.

The nightmare of the whole situation has been that the last survivors of this great species were being ignorantly shot off. Our two years' active search has developed considerable verbal, but no tangible, evidence for this. The latest in this line is the following — which has been given wide publicity (not by me) in the daily press as definite proof that Passenger Pigeons are still being shot. The remains of another Mourning Dove came in from Maine the day after.

Dr. C. F. Hodge,

Dear Sir:

One day recently, while out hunting, I shot a bird and had it mounted by one of our leading taxidermists. It proved to be a "Passenger Pigeon" (*Ectopistes migratorius*). I think it is a young bird as it has dark spots on the back. Please reply giving me some more information concerning this bird.

Yours truly,

Dwight P. Cushman, Hebron, Me.

Oct. 30, 1911.

I did reply, sending leaflets with photographs and underscored boldly in red ink the comparative lengths of the Pigeon and Mourning Dove. I also enclosed the Audubon Association's colored plates of the two birds, and I said:

"If, after examining your bird in the light of the material I am sending you with this, you are still sure that the specimen is a Passenger Pigeon, I would be glad to pay express both ways for a look at it and for the privilege of keeping it a few days to show to the American Ornithologists' Union, which is meeting in Philadelphia soon."

An early express brought a little box with a little stuffed Mourning Dove in it. It went back by return express to Hebron, Maine, express \$.70.

My expenses for the season have been \$99.70. The balance of \$.30 is suggestive. Of this amount Col. Anthony R. Kuser and family voluntarily contributed \$80.

Since writing the above report it has been decided to continue the rewards another season, i. e. until October 31, 1912, as follows:

ONE THOUSAND DOLLARS (\$1000) REWARD

For first information, exclusive and confidential, of the location of a nesting pair or colony of Passenger Pigeons, anywhere in North America; when properly confirmed and if found by confirming party with parent birds and eggs or young undisturbed:

Colonel Anthony R. Kuser will pay a reward of \$300.

John E. Thayer will pay a reward of.....\$700.

For first nesting discovered thereafter in the following States will be paid by:

John Burroughs, New York.....	\$100.
A. B. F. Kinney, Massachusetts.....	100.
Anonymous, Massachusetts, for 2d find.....	100.
Allan B. Miller, for 1st nesting found in Worcester Co., Mass.....	20.
Edward Avis, Connecticut.....	100.
Harry S. Hathaway, Rhode Island.....	100.
Worthington Society, New Jersey.....	100.
John Dryden Kuser, for 2d nesting found in New Jersey.....	10.
Henry W. Shoemaker, Penna. \$200. (adds \$25, if nest is protected)....	225.
W. B. Mershon, Michigan.....	100.
R. W. Mathews, Minnesota.....	100.
Ruthven Deane, Illinois.....	50.
John E. Thayer, Me., N. H., Vt., Ont., Wis., \$100 each.....	500.
John Lewis Childs, for first three nestings not entitled to any of the above rewards, \$200 each.....	600.

The purpose of these offers is to secure an intelligent search of the American continent for breeding Pigeons in the hope that, if found, the species may be saved from extermination.

All above rewards are offered solely and only for information of location of undisturbed nestings. We do not desire possession of any birds, alive or dead, but are working solely to save the free, Wild Pigeon.

As soon as a pigeon nesting is surely identified write the undersigned, who will arrange for confirming party and for payment of the reward. All rewards not claimed by Oct. 31, 1912, will be withdrawn.

Signed, C. F. HODGE,

Clark University, Worcester, Mass.

THE VALIDITY OF THE RED-LEGGED SUBSPECIES OF
BLACK DUCK.¹

BY CHARLES W. TOWNSEND, M. D.

IN April, 1902, Mr. William Brewster described a northern race of the Black Duck,— then known as *Anas obscura*,— under the name of *Anas obscura rubripes* or the Red-legged Black Duck the chief characteristics of which were the large size, the coral red legs, the yellow bill, the coarse spotting of the entire throat and the grayish edging of the feathers of the crown and nape. This form was well known to occur in winter on the New England coast, and Mr. Brewster referred four of the breeding Black Ducks which he had examined to this new race. These specimens came from northern Labrador and the Hudson Bay region. He referred breeding specimens from Newfoundland to the older race, but he admitted that he had “none from any locality south of the Gulf of St. Lawrence which were taken at the height of the breeding season.” He inferred, however, that these belonged to the smaller race with brown or slightly reddish legs, dark or olive green bills, buffy and immaculate, or but slightly spotted throats, and dark crowns and napes.

It should be noted here that not only the color of the legs, but several other factors correlated therewith distinguish these two races. I wish to emphasize this fact for ornithologists are apt to speak as if the color of the legs was the only distinguishing feature.

In April, 1905, in “The Birds of Essex County,” I gave several facts which suggested that *rubripes* might be the adult male of *obscura*, and “assuming for the sake of argument” that this was the case, I pointed out very similar facts in the case of the Red-breasted Merganser where the winter birds in New England are largely old males, while the females and young go south. In conclusion I said: “These observations are of course insufficient for definite deductions, and are offered merely as a contribution

¹ Read at the Twenty-ninth Stated Meeting of the American Ornithologists' Union, November 14, 1911.

to the study of the subject. I have made no observations on the adult male breeding bird in summer in Essex County, and as far as I know this has never been done. Its value in the discussion is obvious." I should have added that as the female often assumes masculine characters with age, it is possible that this fact may explain the existence of female *rubripes*. From the data then at hand, I believe that my position was a logical one, and that one could argue both for and against the validity of *rubripes* as a subspecies. The proofs were still lacking.

In July, 1908, the fourteenth supplement of the A. O. U. Checklist was published in which the name *Anas obscura* was changed to *Anas rubripes*, and the following statement made: "The name *Anas obscura* GMELIN, 1788, proves to be preoccupied by *Anas obscura* PONTOPPIDAN, 1763, for an old world species, and no other name being available, *rubripes* of Brewster is adopted as a substitute. (RICHMOND, MS.) There is some question as to the validity of the form recognized as No. 133a, [the Red-legged subspecies of Brewster] which, by the above action, is now cancelled."

Notwithstanding this statement of skepticism as to the validity of the two races, the next supplement, published in July, 1909, admits its belief in them by recognizing *Anas rubripes tristis* or Black Duck on the basis of a paper on the subject by Mr. Brewster in the previous April, in which, however, no new facts are adduced.

In October, 1909, Dr. Jonathan Dwight maintained that the differences between the supposed races were "exactly the ones that distinguish old birds from young whether they occur in the United States or in Canada" and he added that his evidence on this point was "conclusive."

To this Mr. Brewster replied in July, 1910, and showed that none of Dr. Dwight's evidence was conclusive, and that the only breeding bird examined by Dr. Dwight, shot on Long Island, might easily have come originally from the Bronx or Central Park.

Thus by the whirligig of time and the A. O. U., the Black Duck, so long and familiarly known as *Anas obscura*, becomes a sad subspecies of the upstart Red-leg, and even then its position is disputed, while the erstwhile Red-legged subspecies is put on a secure specific basis. One is forcibly reminded of the behavior of the intruding Cow-bird. The title of this paper should therefore have been

"The validity of the Black Duck," but as that seemed almost insulting to our old friend *obscura*, I have adopted the present title which, although perhaps not entirely correct, will, I believe, readily be understood.

The only way definitely to decide this question is by the observation of native New England birds during a period of several years from their hatching out, or by the observation of breeding birds. Both of these observations I have been fortunate enough to make, for I have watched two pairs of Black Ducks, caught in the down in Massachusetts, from June, 1909, until June, 1911, when one pair had nested. Careful notes of these birds were taken from time to time, and, as far as this experiment goes, it certainly bears out Mr. Brewster's statements, for the breeding birds in their third spring were typical *tristis*.

The birds were captured in the down in Hudson, Massachusetts, on July 15, 1909, and came into the possession of Mr. John Golding of South Sudbury, to whom I am much indebted for his interest and assistance. There were originally five birds, three males and two females. These I labelled on October 2, 1909, by fastening numbered aluminum bands on their legs, and I noted the colors and markings of each. They were kept in a small enclosure out of doors, in which was a pool of water. All thrived but one male that soon died. I visited them again in January, March, July and November, 1910, and in June, 1911. At the last date one pair had died, and the other pair had been transferred to Medfield where I saw them. This pair was given considerable freedom in an enclosure in a natural meadow in which were pools of water, and they had nested. At each visit the birds were caught separately and examined critically in the hand, and the colors of bill and feet and the markings noted down without reference to any preceding notes.

When four months old one of the females had a pure buffy throat, while the other female's throat had a few scattered spots on it. All three males had more or less fine spotting on a buffy ground. The bills of the females were dark greenish black, their tarsi brownish, while the bills of the males tended more to greenish yellow and their legs to orange. The next spring the bills of the males were slightly lighter in color, but by no means yellow, and

their tarsi were possibly a little brighter orange. A study of the plumage showed, however, no suggestion of either an eclipse or a nuptial dress. In the third spring the appearance was essentially the same. The surviving male had a dark crown and nape, a buffy throat, fairly well, but not thickly spotted, a greenish yellow bill and orange feet,—not by any means the coral red feet of *rubripes*. The female had a dark olive-green bill, dirty yellow tarsi and an unspotted buffy throat. Their size was that of the smaller race.

Wood Ducks kept in the same enclosures changed from juvenal to adult plumage, and from eclipse to nuptial plumage, so there seems no reason why Black Ducks should not have changed if it was normal for them to do so. The fact that a pair bred showed they were living under very normal conditions.

That there are distinct racial differences between *rubripes* and *tristis* as originally maintained by Mr. Brewster seems to be thoroughly borne out by these observations carried on during three successive springs under very natural conditions. Yet it might be maintained that the period of these observations was too short, or that the confinement interfered with natural conditions. Be that as it may, these observations are offered for what they are worth as a contribution to the study of the subject.

BIRDS IN THE MARKETS OF SOUTHERN EUROPE.

BY LOUIS B. BISHOP, M. D.

THE year from August, 1910, to July last was spent by Mrs. Bishop and myself in travel in western Europe and northern Africa. Ornithology was not our aim, and no actual field-work was done anywhere. But I kept my eyes and ears open for birds during all parts of our trip as opportunity permitted, and it has seemed to me that what I noticed might be of some interest to the members of the Union in view of the remarkable sentiment for bird protection that has arisen in our country in the last few years.

Only once did we stay over two weeks in a place, and that was in Venice, where the birds for sale in the markets proved so interesting that six weeks had passed before I could tear myself away. You all know no doubt that small birds are sold for food in southern Europe, but the extent of this traffic was astounding to me. And in view of this annual destruction I was much interested to learn what I could of how plenty birds are in regions likely to have been affected by this slaughter.

We reached Venice on October 15, for one of us the first visit to what I think the most fascinating city in the world, and for the other a return after nineteen years. Naturally our first days were fully occupied with other matters, but on the morning of October 24 I visited the central market, and what I found there in the bird-line proved so interesting that Oct. 26, 29 and 31 saw me there again, as did Nov. 1, 2, 3, 5, 7, 8, 10, 12, 14, 15, 16, 17, 19, 21 and 22. Birds were there in profusion from Ducks to Kinglets in the early morning, hung in great bunches above the stalls, but by 9 A. M. most of them had been sold. Ducks and Shorebirds occurred in some numbers, but the vast majority were small Sparrows, Larks and Thrushes. These were there during my visits by the thousands if not tens of thousands. To the market they were brought in large sacks, strung in fours on twigs which had been passed through the eyes and then tied. Most of these small birds had been trapped, and on skinning them I often could find no injury except at their eyes. One of these sacks I examined on Nov. 3 contained hundreds of birds, largely Siskins, Skylarks and Bramblings, and the same species constituted the vast majority of a similar sack noticed on Nov. 17, but in the latter there were many Fieldfares. For Oct. 29 my notes say "Market full of small birds, largely Siskins, hanging in bunches by thread passed through neck and head"; on Oct. 31, "Market full of small birds, chiefly Bramblings, but many Chaffinches and Hawfinches." Again on Nov. 8 I write "Market full of fresh small birds," on Nov. 10 "Many large birds"; and on Nov. 14 "Many small birds, chiefly Bramblings and Siskins." As a rule the small birds that were not sold in the early morning were skinned or picked and their tiny bodies packed in regular order, breast up, in shallow tin boxes and exposed for sale.

During these visits to the Venetian markets I identified sixty species, and procured specimens of most. As nearly as I can remember small birds cost from two to five cents apiece, Thrushes, Shorebirds and Snipe from five to fifteen cents; Coots, Ducks, Partridges and Woodcock from 20 to 60 cents, and Pheasants, of which I saw very few, about \$2.00. For example I paid \$2.15 on Nov. 8 for 1 Woodcock, 1 Jay, 2 Starlings, 2 Spotted Crakes, 1 Song Thrush, 1 Gold-crest, 1 Long-tailed and 1 Great Titmouse, 1 Pipit, 1 Redstart, 1 Skylark, 1 Greenfinch, 1 Bullfinch, 1 Redpoll, 3 Linnets, 2 Goldfinches, 6 Siskins, 3 Reed Buntings, 3 Bramblings and 5 Chaffinches; and on Nov. 10, \$3.25 for 2 Coots, 1 Water-Rail, 1 Spotted Crake, 1 Sparrow Hawk, 2 Woodcock, 1 Common and 1 Dusky Redshank, 2 Dunlins, 1 European Curlew, 2 Kingfishers, 2 Greenfinches, 2 Wrens, 1 Great and 1 Blue Titmouse, and 1 Redbreast. No doubt I paid over regular rates, as I could speak little Italian and the market men knew I wanted them to stuff.

No Gulls were seen, so apparently they are beyond even the Italian appetite, but a Little Grebe (*Colymbus fluviatilis*) was found once and once a Sparrow Hawk (*Accipiter nisus*).

Of Ducks, Widgeons (*Mareca penelope*) were common, and Teal (*Nettion crecca*), Mallards (*Anas platyrhynchos platyrhynchos*), Shovellers (*Spatula clypeata*) and other species occurred more or less frequently. Of the Rails I noted Water Rail (*Rallus aquaticus*), Spotted Crake (*Porzana porzana*), Coots (*Fulica atra*) and Gallinule (*Gallinula chloropus*). Among the Shorebirds were Woodcock (*Scolopax rusticola*), Common and Jack Snipe (*Gallinago gallinago* and *Limnocryptes gallinula*), Greenshanks (*Glottis nebularius*), Common and Dusky Redshanks (*Totanus totanus* and *Totanus fuscus*), European Curlew (*Numenius arquatus*), Dunlins (*Pelidna alpina alpina*), Lapwings (*Vanellus vanellus*) and Blackbreast Plover (*Squatarola squatarola*).

Of the Grouse and Partridges I noticed Red-legged and Gray Partridges (*Caccabis saxatilis* and *Perdix perdix perdix*).

Blackcocks, Pheasants and *Tetrastes bonasia*, Kingfishers (*Alcedo ispida*), I found only once.

Skylarks (*Alauda arvensis arvensis*) were there in great numbers and sometimes Calandra (*Melanocorypha calandra calandra*) and

Crested Larks (*Galerida cristata cristata*) appeared. Starlings (*Sturnus vulgaris vulgaris*) were common and there were a few Jays (*Garrulus glandarius glandarius*). But of all the birds in the market the majority belonged to the great sparrow tribe. Siskins (*Spinus pinus*), Bramblings (*Fringilla montifringilla*), Chaffinches (*Fringilla cœlebs cœlebs*) and Tree Sparrows (*Passer montanus montanus*) suffered most severely, but I noticed also Hawfinches (*Coccothraustes coccothraustes coccothraustes*), Bullfinches (*Pyrrhula pyrrhula europæa*), Yellow Hammers (*Emberiza citrinella citrinella*), Goldfinches (*Carduelis carduelis carduelis*), Greenfinches (*Ligurina chloris chloris*), Italian House Sparrows (*Passer italiae*), Redpolls (*Acanthis linaria linaria*), Linnets (*Acanthis cannabina cannabina*), Crossbills (*Loxia curvirostra curvirostra*), and Reed Buntings (*Emberiza schœniclus schœniclus*).

Redbreasts (*Erithacus rubecula rubecula*) were common and Stonechats (*Pratincola torquata rubicola*) and Redstarts (*Phœnicurus ochruros gibraltariensis*) rare. Great Titmice (*Parus major major*) were seen almost daily, and occasionally Blue (*Parus cœruleus cœruleus*), Coal (*Parus ater ater*) and the Longtailed (*Ægithalos caudatus irbiï*). Wrens (*Troglodytes troglodytes troglodytes*) were seen several times and the Goldcrest (*Regulus regulus regulus*) once. Rock and Meadow Pipits (*Anthus spinoletta spinoletta* and *Anthus pratensis*) and White Wagtails (*Motacilla alba alba*) were uncommon, but the Thrushes, such as the European Blackbird (*Merula merula merula*), Fieldfare (*Turdus pilaris*), Redwings (*Turdus iliaxa*) and Song Thrushes (*Turdus musica*) were all abundant.

That killing song-birds for food is not confined to the poor Italians I learned on Oct. 27, when one of the most prominent and wealthy Italian ornithologists—a delightful man—told me he had shot 180 Skylarks and Pipits the day before, and that his family liked them far better than other game. Our prejudice against selling game does not exist in Europe, and this same ornithologist told me he often shot 200 ducks in a day at his shooting-box, sending to the markets what he could not use himself. On Nov. 1, 1910, he shot 82 ducks and on Nov. 8, 103, chiefly Widgeon and Teal.

In Florence I visited the central market on Nov. 26, 28, 29, 30, Dec. 1, 2, 3, 5, 6, 7, 8 and 9, and found birds even more plenty than

in Venice. Pheasants, Grouse, Partridges (*Caccabis petrosa* and *Perdix perdix perdix*), Ducks, Woodcock, and Snipe especially were more abundant than in Venice, probably because Florence is a wealthier city; and Skylarks, Thrushes and Redbreasts were found in very large quantities. Corn Crake (*Crex crex*), Thickknee (*Edicnemus edicnemus*), Green Sandpiper (*Helodromas ochropus*), Dotterel (*Eudromias morinellus*) Golden Plover (*Charadrius apricarius*), Magpie (*Pica pica pica*), Corn Bunting (*Emberiza calandra calandra*), Migratory Quail (*Coturnix coturnix*), Green and Spotted Woodpeckers (*Gecinus viridis pronus* and *Dryobates major pinetorum*), Wood Larks (*Lullula arborea*), Gray Wagtails (*Motacilla boarula boarula*), Brown Creeper (*Certhia familiaris macrodactyla*), Nuthatch (*Sitta europæa cæsia*), Hedge Sparrow (*Prunella modularis modularis*), Black-cap, Black-headed and Fantail Warblers (*Sylvia atricapilla atricapilla*, *Sylvia melanocephala melanocephala* and *Cisticola cisticola cisticola*), Missel Thrush (*Turdus viscivorus viscivorus*), Ring Ouzel (*Turdus torquatus alpestris*) and Rock Sparrow (*Petronia petronia petronia*), were species that I had not noticed in Venice. Here too we saw often, bunches and baskets of small birds, chiefly Redbreasts, hawked through the streets, and I saw in the little town of Fiesole on Nov. 27 a bunch of Fieldfares, Redwings and Blackbirds hanging outside a store.

Every Sunday that we went into the country we met numbers of Italians out shooting, and their bags seemed to consist wholly of small birds.

At Genoa, San Remo, Monte Carlo and Nice, between Dec. 13 and 29, I did not visit the central markets, if such exist, but saw frequently bunches of small birds hanging outside stores. The only new species noted was a Blue Rock Thrush (*Monticola solitaria solitaria*) at Monte Carlo on Dec. 22.

A gentleman who spent the fall in an automobile trip through the west of France from Brittany to the Pyrennees tells me he noticed these bunches of small birds for sale in every town he visited.

In Algiers I visited the markets on several occasions, but saw no birds smaller than Thrushes for sale; but there were plenty of Song Thrushes on Jan. 6, 7, 9 and 11; a Frenchman shooting Thrushes I saw near Algiers on Jan. 2, and two natives with a bag

of a Shrike (*Lanius excubitor algeriensis*) Blackbirds (*Merula merula algira*) Song Thrushes and Redbreasts (*Erithacus rubecula witherbyi*) we met some twenty miles from Algiers on Jan. 10.

January 17 was market day at Setif on the high plateau in the interior of Algeria, and there I noticed three natives with about 100 Calandra Larks and Skylarks (*Alauda arvensis arvensis* and *A. a. cantarella*) for sale.

At Biskra, an oasis in the northern border of the Sahara, the natives do not eat birds, so none were for sale in the markets, but I found Sand Grouse (*Pterocles arenarius*) and Red-legged Partridges at the store of a Frenchman. In Constantine on Feb. 5 and 6, I saw a few Sky and Crested Larks (*Alauda arvensis arvensis* and *Galerida thekla superflua*) and Song Thrushes in the market, and Thrushes were on the bill of fare at Hammam Meskoutine. Behind the hotel there I noticed on Feb. 8 the feathers of hundreds of Thrushes, Starlings and Blackbirds that had been plucked for the guests.

In Tunis I visited the large central market — one of the finest I saw abroad — on Feb. 11, 12, 13, 14, 17, 18, 19 and 20, and found it to contain hundreds of Starlings (*Sturnus vulgaris vulgaris*) Sky, Crested and Calandra Larks (*Alauda arvensis cantarella*, *Galerida cristata macrorhyncha* and *Galerida thekla harterti*) and Song Thrushes, besides an abundance of what we consider game.

In Sicily Mr. Whitaker, the eminent English ornithologist, told me small birds were not sold in the markets, but between Feb. 23 and March 12 we frequently saw men out hunting especially on Sundays.

At Naples on Sunday, March 19, Plover was served on the hotel table, and we noticed a man out in the country with a gun. On March 20, I saw a man with a bunch of Ruffs (*Machetes pugnax*), Black-tailed Godwits (*Limosa limosa*), Lapwings and small birds for sale, and on March 16 on the Via Roma, the busiest street of the city, we met a man with a number of Greenfinches sitting on his arms and shoulders. To a cursory glance, these birds seemed well but stupid. Why they did not fly away, for their wings were uninjured, is probably explained by the following clipping from the Italian Gazette for Dec. 1, 1910, an English paper published in Florence.

"The Blinded Birds.

In consequence of a letter which appeared in our issue of October 27, the Florence Society wrote to the head of the Municipal police, Cav. Grasselli, calling his attention to the fact that in spite of the injunction issued by the Commissario Prefettizio, blinded birds were still being sold in the Commune of Florence, namely, in a shop in the centre of the town. The Municipal police at once received orders to see that the injunction was respected, and a number of fines quickly put a stop to the surreptitious traffic.

When the Commissario (Cav. Ferrara) took the step of prohibiting the blinding of birds and the sale of those already maimed, the Florence Society sent a copy of his circular to all the municipalities in the province, asking them to follow suit. To their honor four — the communes of Fiesole, Tavarnuzze, Cutigliana and Pontassieve — readily expressed their intention of doing so, but the remainder have treated the request with indifference.

But even should the Municipal authorities be backward in carrying out the law, it is in the power of anyone to denounce to the Municipal police of any commune acts of cruelty of this kind and to exact a prosecution. The Pretor of Arezzo, Signor De Santis, recently fined a man 100 lire, the maximum, on the information of a private individual, and that sentence is a precedent which cannot be ignored.

No doubt the practice of blinding birds will come to an end in Florence and the neighborhood. When the birds thus treated can no longer be put on sale without the risk of a fine, it will interest no one to commit such a horror. The birds were blinded chiefly in spring, though the Florence Society has information that cases have occurred even in winter."

In Rome Partridges were served at the hotel in early April; April 10 I saw a man out shooting between Rome and Florence, and in the market at Florence on April 11 were large numbers of Pheasants, Woodcock, Snipe, Redshanks and other Shorebirds, but no small birds, as it is against the law to sell them at that time.

At Dresden on May 18 and Halle on May 25, Gulls' eggs were for sale in the markets, and game was on the bill-of-fare in Dresden. Our last experience with game on the table was on July 4, when

"Delaware Snipe" was served on the steamer some few hundred miles out of New York.

In England at Flamboro Head in Yorkshire on June 19, eggers were taking for market the eggs of Murres, Razor-billed Auks, Puffins, and Kittiwakes, as they have for generations, and the English treatment of the Wood Pigeon the following extracts from the "London Daily Mail" for last March will show.

"Pigeon Plague
Slaughter in the Isle of Wight.

A great slaughter of wood pigeons took place yesterday all over the Isle of Wight, where farmers have suffered severely from the depredations of the birds. It is estimated that quite a thousand guns were enrolled for the campaign, among them being landowners, occupiers and shooting tenants, who were publicly invited to take part. The guns were stationed in woods and coppices over a wide area during the afternoon, and they remained there until dark. Some large bags were obtained.

In the neighbourhood of Saffron Walden, Essex, another district where the birds are a plague, farmers, sportsmen and gamekeepers, will tomorrow renew the combined attack of Saturday last upon marauding flights of wood pigeons. Last Saturday nearly 200 guns turned out. Tomorrow it is expected that nearly double the number will take up the assault.

The lesson of the efficacy of such an assault was first taught by the farmers of Devon and Somerset a few years ago, when great combined shoots were organized as a result of the havoc wrought by these feathered aliens among the green crops of the neighbourhood. Many thousands of wood pigeons fell as a result, and the plague was considerably minimised, if not absolutely brought to an end, over a large area of country.

The plan of campaign last Saturday was to make a simultaneous attack on the birds as they returned in the late afternoon from the fields to their roosting-trees.

It was decided to man all likely places which the birds might pass on their homeward flight, and many such places were manned. The destruction already wrought shows the wisdom of combination in this direction, and the two more Saturday assaults which will

complete the campaign should, with good tactics, complete its success."

"War on Wood Pigeons.

The war against wood pigeons was continued in nearly all the southern counties yesterday.

'Our advice to all farmers who are suffering from the plague of the birds is, "Shoot them."' Mr. A. G. L. Rogers, of the Intelligence Department of the Board of Agriculture and Fisheries, told a 'Daily Mail' representative.

'It is best to get at them either at day-break or sunset, and scare them out of their roosting places, or the haunts they flock to for water. Half-measures are not much use; wholesale extermination is the policy if the farmer wishes to preserve his crop.

'In the north they are not troubled anything like to the same extent. There is not the same temptation as in the south. They flock to the southern counties because there is far more in the shape of food-stuff.'

How great is the destruction of small birds at the hands of man in Europe and northern Africa these pages will give an idea, but of the actual number, especially of Skylarks, slaughtered for food no computation is possible. It probably reaches the hundred thousand. And this destruction of small birds during the migration for food by the Italians has been going on for years. Mr. E. A. Samuels in "Mammalogy and Ornithology of New England," published in 1863, quotes Frederick de Tschudi, the president of the Agricultural Society of Canton St. Gall, Switzerland, as writing "At the period of their spring migration, and still more in autumn, Italians are seized with a mania for killing small birds." "To form some idea of the slaughter which for weeks together is the chief delight of the people of Italy it is sufficient to mention that in one district on the shores of the Lago Maggiore the number of small birds annually destroyed amounts to between 60,000 and 70,000, and that in Lombardy, in one single *roccolo*, 15,000 birds are often captured daily. In the neighborhood of Bergamo, Verona and Brescia, several millions of birds are slaughtered every autumn."

In Bird-Lore for July-August, 1907, Mr. Francis H. Herrick

gives Signor Nigro Licò as quoting "It is estimated that in all Italy the annual hecatomb amounts to ten millions of individuals, among which the Landsteiner of Wiholsburg reckons three millions Swallows," and also as saying "if after all this there can still regularly occur that enormous slaughter of millions of little birds, so that they can be seen in the markets like sacs full of grain, then why condemn absolutely hunting by means of nets, since by this very showing the method of hunting has not yet caused grave damage?"

But what of the reverse of the shield? Are small birds rare or common throughout Europe? This I tried to determine as far as I could in the limited opportunities at my disposal, for most of our time was spent in large cities, and the trip to Flamboro Head in June was the only one taken in which birds were the object sought. On our walks or drives in the country I noticed the relative abundance of birds as far as possible, and trust the following brief extracts from my note-book may be of interest.

Of the ten days in the beginning of September, 1910, which we spent in England, six were devoted to London, still I note that Lapwings, Rooks, Wood Pigeons and many small birds were plenty near Chester, and that "I have been impressed by the great abundance of birds in England as seen from the train and driving, in spite of cloudy weather." At Lucerne on Sept. 21 large Swifts were seen, at Oberammergau on the 24th, Coal Titmice and Gold-crests; Mallards were common and tame at König See on October 11, and we met a large flock of Bramblings at Innsbruck on the 13th.

During our stay in Venice, Black-headed Gulls (*Larus ridibundus*) frequently were abundant in the Grand Canal, and Starlings and Italian House Sparrows were often noticed. Birds were not plenty along the Riviera, Dec. 19 to 25 as a rule, but we noticed many small ones in the shrubbery at Monaco on Dec. 20, and a large flock of some very noisy species in some trees at Mentone on Dec. 22. In the groves and bushes in the outskirts of Algiers small birds were abundant during the first part of January and among them I identified Crossbills. In the open country further from the city, Skylarks and Pipits were numerous, and on an automobile trip of about 80 miles which we took on Jan. 10, I wrote "Country

open and full of birds of many species." In the Kabyle country in the Atlas mountains, where we were Jan. 14 to 16, birds were not very plenty, but I noticed Common Crows, Kestrels and Harriers from the train, and a very large flock apparently of Thrushes collecting in a wooded swamp toward evening. On the open plains of the high plateau of Algeria, across which we passed by train, birds were not very common, as was to be expected in such a country in the depth of winter; still I noticed frequent flocks of small birds and was able to identify Skylarks and White Wagtails. In the palm-groves of Biskra small birds were again plenty, and some at least were European species.

Farther east in the interior of Algeria I noticed from the train on Feb. 3, very many Lapwings and Common Crows and large flocks of small birds, and small birds were abundant at Hammam Meskoutine on Feb. 8. On Feb. 11 I note "saw many birds, largely larks, near Carthage," and on Feb. 15 and 16, during an automobile trip of some 150 miles between Kairouan and Tunis, I write "saw great numbers of Larks, Sky, Crested and Calandra, very large flock of Ducks, also Lapwings and other species." Both these days at Kairouan and Tunis we had Larks for dinner.

In Sicily small birds seemed by no means abundant, as might be expected from the generally treeless and bushless landscape, but in the old quarries at Syracuse, now filled with luxuriant vegetation, birds were again abundant. Near Naples the latter part of March birds seemed uncommon, and the same was true of the trip from Naples to Rome, and from Rome to Florence; but Kestrels (*Falco tinnunculus*), appeared to be breeding in the capitals of the pillars at St. Peter's at Rome on April 4, others in the niches in the Leaning Tower at Bologna on April 20, and still others in the Amphitheatre at Verona on April 26. In the environs of Ravenna on April 18, from the train between Ravenna and Milan, Milan and Como, and from Milan to Venice, and about the Italian Lakes especially the latter part of April, birds were plenty, and I wrote "noticed birds fully as frequently as at home." In Venice the last of April large Swifts wheeled over the canal and buildings in good numbers, and there were many birds in the Public Gardens on April 27. At Kahlenburg near Vienna on May 13, and at Babelsburg near Berlin on May 17, birds were abundant, and I

noted in short walks, Blackbirds, Chaffinches, Starlings and several species of Tits, and none of the vegetation showed any sign of injury by insects.

We reached England in early June, but except for a short trip to Flamboro Head in Yorkshire, and a couple of days at Southampton, during which we visited the New Forest, our time was spent in London, and even in London Wood Pigeons were common in the parks. But one cannot visit rural England at all, either by train, motor, carriage or on foot, without being impressed by the abundance of birds; birds are everywhere, Lapwings fly out of almost every field, in spite of the fact that their eggs have been sold as delicacies for generations, Skylarks are constantly in the air, Rooks dot the landscape with black, and thousands of sea-birds line the cliffs at Flamboro Head although their eggs are collected each day. My impressions at the conclusion of our long journey, as I wrote them at the time, were that "birds are quite as abundant in Europe and especially in England as with us, and I have been greatly impressed by the absence of insects and worms everywhere, along the roadsides, in the parks and woods and in the fields. No worms hanging from the trees, no mosquitoes, no aphides on the roses, and nothing showing signs of having been eaten; all so different from our country in June."

Why this is so, that after the great slaughter in fall and winter birds are so abundant in spring and summer I cannot explain, but both of us commented on the fact that we almost never saw a cat.

ADDITIONS TO THE KNOWN ORNITHOLOGICAL
PUBLICATIONS OF C. S. RAFINESQUE.

BY SAMUEL N. RHOADS.

IN looking up references to the published writings of Constantine S. Rafinesque for material relating to Birds, I have secured verbatim copies of two interesting contributions of his to the Kentucky Gazette. These, evidently, were not known to Dr. C. W. Richmond when he published reprints of Rafinesque's contributions to Ornithology in 'The Auk', Vol. 26, 1909.

So rare is the Kentucky Gazette at this writing, that only one file of it and that quite imperfect is available for reference. This is in the Library of Congress, and through the liberality of Mr. Herbert Putnam I have been able to get copies of the articles referred to. They were published under the sub-title of "The Cosmonist." It will be noted that these are Rafinesque's third and fourth Natural History contributions to the paper, under this heading. It is likely if a complete file of the Kentucky Gazette could be secured that some other references to birds might be found therein, for Rafinesque in his later publication, "The Atlantic Journal," page 208, refers to "twenty numbers" of "The Cosmonist" as having been published.

For an essay on "Rafinesque as an Ornithologist," the reader is referred to the recent issue of "Cassinia" for 1911, published by the Delaware Valley Ornithological Club. The following reprints were considered too long for that article and more appropriate for 'The Auk', in which Dr. Richmond's articles on Rafinesque's writings appeared.

Fortunately for our author, these articles are based on his own personal observations of the birds described and from actual specimens, in contrast to his bird notes founded on the fishy stories which were confided to him by Audubon when the two met on that memorable occasion at Henderson, Kentucky. Indeed these two Kentucky Gazette articles do more credit to Rafinesque from the ornithological standpoint than all the rest of his bird papers put together and atone in no small degree for the curious performances

in this line which he was led to make through his too ready credulity and mad quest after new species and genera.

They give also an insight into his higher self as an enthusiastic admirer and real lover of nature, a phase rarely exhibited in his published writings of later date. Of what extreme interest would be a discovery of his manuscript on the Ornithology of the United States to which he alludes in his remarkable review of Alexander Wilson's work.

"Kentucky Gazette.

Lexington, K. Thursday Morning February 14, 1822.

Page 3, Col. 4

THE COSMONIST — No. III.

On the Birds of Kentucky and a new Swallow.

Among all the tribes enlivening animated Nature, there are few if any, that are so interesting as the Birds; those aerial beings who enjoy the glorious privilege of roaming th[r]ough the atmosphere, and soaring to the clouds, whence they often may look down with pity upon us confined as we are to creep on the ground. Their lively plumage, and elegant forms charm the eyes, while their melodious voices and varied songs delight the ears.

Ornithology or the branch of Cosmony, which leads us to become thoroughly acquainted with their history and manners, has therefore been cultivated sooner and better than many other branches of natural science. * * * * The splendid works and colored figures of Catesby, Edwards, Buffon, Vieillot, and Wilson, have contributed to make known, the greatest number of the beautiful Birds which live in North America.

The magnificent work of Wilson, published in our country, is well known; and although it has remained imperfect by the untimely death of the author, it stands as a monument of genius, science, and taste. It is also a pity that the worthy author was not aware, that another American Ornithology had been undertaken some years before his (in France, by Vieillot) which has likewise never been completed, where some of his new species were previously described under different names.

The result of Wilson's labors, consist in about 320 figures, belonging to nearly 300 species, among which he has described 56

as new, which might be reduced to less than 50, by comparing them with Vieillot's new species; but increased to about 70, by adding thereto several birds which Wilson did not consider as new, and blended with foreign species, while they are really distinct, and ought to be separated, distinguished and named, as I have done in my manuscript criticism on his work.

Extensive as this number may appear it is less than one half of the real number of our birds. In Ord's Catalogue of the Birds of the United States 573 species are enumerated; but in my Manuscript Catalogue I have ascertained and distinguished above 660 species, among which about 60 species, have been discovered by myself and described as new; Some of these are already published; but the greatest part are only extant in my manuscripts.

Among this number I have already observed and ascertained that upwards of 200 species are found in Kentucky, nearly 40 of which are new for the science of ornithology. These new species belong principally to the Genera or tribes of Warblers, Rails, Hawks, Ducks, Swallows, &c.

Some of our Birds belong even to new Genera, and I published in 1818 in the French Journal of Physics and natural history, the description of a new genus under the name of *Rimamphus citrinus*, to which a single species belongs, which was first discovered in 1808 near Louisville by Mr. Audubon, and mistaken for a Warbler; but it is distinguished from that tribe by its bill open on the sides, and round mandibles. It is besides a silent bird of a pale yellow colour.

There are two species of Swallows in Kentucky, besides several well known species. One of them the red-head Swallow (*Hirundo phenicephale* in ornithology) was already mentioned in my annals of nature No. 1. spec. 16. It is a rare species; grey above, white beneath, with a scarlet head, the bill and feet black.

The second species I shall now describe and call it the Blue Bank-Swallow. I have given it the scientific name of *Hirundo albifrons* which means the Swallow with a white forehead. It is very remarkable by its unforked tail: almost all the Swallows having a large forked tail, and a few species a large stiff and sharp tail; but in this new Swallow the tail is small and truncate, neither sharp, stiff nor forked; this peculiarity occurs also in a South

American species, the Tapera Swallow (*Hirundo tapera*) which is however totally different from ours, being black above and white beneath.

Our Blue Bank-Swallow is a small species, about five inches long: it has a black bill and brown feet. Its face or the space surrounding the bill is black, the forehead white, the top of the head blue; the cheeks, throat and upper part of the rump of a reddish chestnut colour, or rufous, the back is blue spotted with white, the belly of a dirty white, the wings brown, with some yellow spots beneath at the base, and the tail is equal, unforked, truncate and brown.

This pretty Swallow is found on the banks of the Ohio, where it has only been lately noticed; whether it has lately come there from southern regions or had not been noticed heretofore, may be a matter of doubt, but of little consequence. It appears now to be rather common on some peculiar spots, such as near Newport in Kentucky and Madison in Indiana; it comes late in the Spring builds its nest on the high banks of the river and disappears early. Its nest is singular, in the shape of a reversed bottle, with the opening at the end of the neck; the materials being similar to those employed by the common Swallows. This bird is to be seen preserved with its nest in the Museum of Cincinnati: It deserves the further attention of the friends of science.

C. S. RAFINESQUE."

The White-fronted or "Blue Bank Swallow" of Rafinesque, or, to be more brief, the Cliff Swallow of authors, is destined to go down into the history of nomenclature as a distinguished bird. It made so many narrow escapes of being properly named in a binomial sense that it seems a bit humiliating for it to now be snatched from the laurel crown of Thomas Say and transferred, by the rights of priority, to a man whom he undoubtedly despised and certainly ignored. Say was one of the coterie of Philadelphia naturalists that eventually drove Rafinesque and his literary contributions from any recognition by the Academy of Natural Sciences. Whatever Say may have lost, Rafinesque certainly gains greatly in having won, in the priority game of naming and properly describing the Cliff, or Eave or Republican Swallow as

Hirundo albifrons. Say described it in 1823 in the Narrative of Long's Expedition to the Rocky Mountains, under the name "*Hirundo lunifrons*," at least a year later than our Kentucky author's description, as above. It is amusing to read Dr. Elliott Coues' history of the discovery and naming of this species on pages 428-429 of that masterpiece of his, the "Birds of the Colorado Valley." Had he known then of Rafinesque's name for it, we would perhaps have had one more of those epigrammatic paragraphs in which he would have depicted how that eccentric naturalist had stolen the march on all his distinguished contemporaries by a little squib in the Kentucky Gazette. In this connection let us observe that its discoverer names Newport, Ky. as a locality for this species. This town was directly opposite Cincinnati, where Audubon, in 1818, was mounting birds for the Natural History Museum, and it is not unlikely that one of Audubon's specimens was Rafinesque's type!

The second article is as follows:

"Kentucky Gazette.

No. 8. Vol. I. Lexington, K. Thursday Morning, February 21,
1822.

Page 3, Col. 5.

For the Kentucky Gazette.

THE COSMONIST — NO. IV.

By winter's gales and stormy winds impell'd,
They leave the briny waves and stray beyond
Their usual haunts, in search of climes unknown.

On the Wandering Sea-birds of the Western States.

Extensive tribes of Birds dwell on the Ocean; they have been met one thousand miles from any land; they fly and skip over the waves, swim and dive in search of food, repose and even sleep on the water; they often defy the storms, and come near the shores merely when the need of laying their eggs compels them to seek convenient places and shelters.

The Sea-birds very seldom wander in the continents, and far from their usual element and food, which consists in fishes, sea-animals and sea-weeds. It was therefore with some astonishment

that I have observed several of them in Kentucky, Ohio, Indiana, &c. Some appear to follow the meanders of the Mississippi and Ohio, and to ramble at a great distance from the gulf of Mexico, their native place, finding probably an adequate food in the variety of fishes swarming in those noble streams.

Pelicans have been seen and shot on the River Ohio, as far as Louisville, Cincinnati, and Portsmouth, nearly 2000 miles from the gulf of Mexico, by the course of the rivers, although only one third of that distance in a direct course. Some few individuals have been seen both in summer and autumn; but do not appear to have raised their young in our rivers.

The other sea-birds which I have observed or noticed in the interior of the western states, belong to the genera of Divers, Gulls, Terns, Phalaropes, Grebes, Sea-ducks, &c. They were seen on the Ohio, Kentucky, Licking river, &c. or even near Lexington and Harrodsburg.

A Loom [sic] was shot near the Kentucky river in the spring of 1821. Several Phalaropes have been shot near Louisville and Henderson. If these birds wandered from the gulf of Mexico, the distance from it in a straight line, was about 600 miles. A Carolina Grebe, (*Podiceps Carolinianus*) was shot at Harrodsburg in March 1821, which came probably from the nearest Atlantic shore of North Carolina, at the distance of 400 miles or more.

These birds must probably be blown from the sea-shore, towards us by some violent storms, and many more in the same predicament may escape our notice. This singular fact in their History deserves however to be recorded.

Among the sea-birds which I have seen in Kentucky, there are two kinds, a Gull and a Tern, which I cannot find described in any book; they might be considered as new species. They must probably have wandered here from the distant shores of the Mexican Gulf and Empire, where many unnoticed birds must exist as yet.

The Gull might be called the wandering Gull: I have given to it the ornithological name of *Larus Marginatus*, which has a reference to its black-edged wings.

Its total length was one foot; but the dimension of the extended wings reached 28 inches. Bill black, feet of an orange color, with

black claws. Head, neck, and belly of a snowy white, back and wings of a pale ash color; but the quills of the wings are white, with a black tip, and the external quill is edged with black, which gives to the whole wing the appearance of having a black edge. The tail is white, and obtuse.

The known species to which it resembles most, is the grey gull, (*Larus canus*) which is found in the United States, and even on our large lakes; but it differs from ours by being much larger, having a yellow bill, greenish feet, several black quills in the wings with white spots &c.

It was shot in January 1821, on a pond near Harrodsburg by Mr. Sutton, and the specimen is in the possession of Doctor Graham of the same town.

The tern or Sea-Swallow may be called the black-headed Tern; I have given it the scientific name of *Sterna melanops*, which implies the same thing.

This Tern was nine inches long from the tip of the bill to the end of the tail, and the dimension of the extended wings was 21 inches. It was of an ash color above, and white beneath with the head, neck and feet blackish. The bill was of a lead color, one inch long, compressed and sharp. The feet had three half-webbed toes, and none behind. The tail was long and forked, white beneath.

This bird is totally different from all the known Terns, and might even perhaps be considered as a new genus, by its long, compressed bill, toes only half-webbed, and want of a hind toe, to which the name of *CHLIDONIAS MELANOPS* might be applied.

It was shot in June 1821, near Harrodsburg, and was preserved by Dr. Graham, in whose possession I saw it.

C. S. RAFINESQUE."

I have consulted with Mr. Witmer Stone, regarding the status of the new species and new genus above described by Rafinesque. We are agreed that *Larus marginatus* Raf. was a Bonaparte's Gull, *Larus philadelphia* (Ord) in winter plumage. It is a synonym of Ord's species, the latter being named in Guthrie's Geography, 2nd Amer. edition, vol. 2, in 1815. *Sterna melanops* Raf. is readily recognized to be a Black Tern in winter or autumn

plumage. The proper specific name of this species is *surinamensis* (Gmelin), given in 1788, so *melanops* is a synonym. The generic (or subgeneric) name of *Chlidonias*, applied to this species by Rafinesque, based, as it is, mainly on the absence of a hind toe, is of peculiar interest, as it appears to have a priority of above 2 months over the previously accepted name of *Hydrochelidon* given this genus by Boie. Boie's name was published in the fifth number of Oken's magazine, *Isis*, for the year 1822. This would make May of that year the date of publication, whereas Rafinesque's name appeared February 21st. Having determined that Rafinesque's species was the Black Tern we can hardly avoid recognizing the tenability of the generic name of which it is the undoubted type, although the character of the hind toe which he mentions was either a deformity or resulted from the work of the taxidermist in preparing the specimen. In other words, no known species of the subfamily *Sterninae* normally lacks the hind toes.

As Rafinesque did not base his separation of this genus from *Sterna* wholly on the absence of hind toes but upon one or two other characters, including those of the bill, it would seem necessary to supersede *Hydrochelidon* Boie by *Chlidonias* Rafinesque and to name the Black Tern, *Chlidonias nigra surinamensis* (Gmelin), unless it be considered that his name is identical with *Chlidonia* Hübner, 1816.

NOTES ON THE SPRING MIGRATION AT TIMBER LINE, NORTH OF GREAT SLAVE LAKE.

BY DAVID E. WHEELER, M. D.

THE spring of 1910 I spent with the Dog-rib Indians. During April we hunted the wooded country between Fort Rae on Great Slave Lake and Fort Enterprise.

Only the foundations of Fort Enterprise are left but the place is accurately located on the Canadian maps from Sir John Franklin's survey. I think no white man has visited it since 1821, the date of Franklin's departure. The clearing about the fort is still well

defined although the appearance of the stumps indicates that no trees have been cut since that great explorer lived there. In other words nature has made no appreciable effort at reforestation in ninety years. The trees in the surrounding grove are at least five hundred years old. We found 1910 to be a very poor caribou year, yet during April our lodge took and used twenty-four, all females or yearlings.

May first I crossed the Coppermine River with one lodge of Indians. About twenty miles out on the Barrens we saw a band of ten caribou, all females or young. We killed only one of these. They were the last females we saw. I got a very strong impression that the caribou wintering between Rae and Enterprise in 1910 belonged to a herd of females, that this herd was almost completely exterminated during the winter and that in consequence there was practically no spring female migration at Fort Enterprise in 1910.¹

At Diri Ti we left the squaws in a grove of large spruce and fir trees — the only grove known northeast of the Coppermine River. Two of the bucks and myself hunted the country west of Conghia Ti, but without success. We then returned to Fort Enterprise to await the migration of the stag caribou. Two of our dogs starved to death and we ourselves were slightly weakened from lack of food.

May 14 one of the Indians killed a Richardson's Barren Ground Bear. It was very fat, and its stomach contained two fish and a ground squirrel but its main food had been berries which had stained the whole intestine purple. A similar stain dyed the intestines of Ptarmigan taken at this season.

May 18 the migration of the stag caribou commenced. It lasted about ten days. The numbers in this herd were too large to estimate. Bands ranging from ten to two hundred were constantly passing. We killed thirty. Then the chief told us to kill no more as we had enough. I saw no females in this herd, and I believe that they had wintered in some place unknown to the Indians.

May 30, we returned to the Barrens. In the woods the snow had melted and the ground was bare but beyond timber line there was enough snow for travel with dog sleds. We went east of north and in six days reached a point near to the spot where the

¹ The fur traders at Rae have written to me to say that in 1911 the caribou returned in their usual numbers.

Arctic circle cuts Bathurst Inlet. Every night it froze, and every day there was a heavy thaw; yet at our turning point there was more snow than there had been at our starting point. The first day out we caught up with the migrating stags and saw at a very rough estimate about one thousand of them. These were the laggards, the fat old gentlemen, big and heavy with horns in the velvet and about two feet long. After this we saw fewer each day and the individuals seen averaged younger, thinner and more active.

At our turning point we had reached the vanguard and saw only about two hundred, all of them young — "runners" as the men of Newfoundland call them. These Barren Ground Caribou impressed me as being much more nearly related to the Newfoundland Caribou than to the Woodland Caribou.

On the way back we soon came to bare ground and left our sleds packing out our blankets on our backs. We reached Enterprise June 11. By this time all the caribou were beyond the Coppermine River.

We stayed at Enterprise about a week and then set out for Rae. The first lake crossed was choked with ice but there was open water in all the rest of them.

Seven species of trees were noted. The Spruce (Dog-rib name-*Tsi*). Is found as a large tree to the edge of the Barren Lands, and in isolated groves many miles beyond the line of continuous timber. Stunted, dwarf trees (Dog-rib name *Tchu nêch'oli*, usually translated "the land of little sticks") occur south of timber line and also on the Barrens as an irregular fringe rarely more than a few miles from the large trees. The banks of the Coppermine River below Lac de Gras and the shore of the Southern extremity of Diri Ti are well wooded. No wood is found between Winter Lake and the Coppermine or between the Coppermine and Diri Ti. There is a fir tree (Dog-rib name — *Tsi*), which only grows North of Aiejean Ti,¹ found wherever the Spruce reaches large size, even in the groves far out on the Barrens. It does not occur south of Aiejean Ti. The trees are more spreading and even than the Spruce, and their bark is thin, pale, smooth and contains blisters

¹ Aiejean Ti = Spirit Lake.

of balsam. The indians recognize them as different from the Spruce, although they have no separate name for them.

The Gray or Jack Pine *Pinus divaricata* — (Con of the Dog-ribs), Tamarack (*Larix americana* — Dog-rib name *Inne doui*), and Poplar I did not find north of Aiejean Ti, Willows occurred as dwarf trees sparsely all over the barrens, extending far beyond the Spruce. Canoe Birch, *Betula papyrifera* — (Dog-rib name *Ki*) was found north of Aiejean Ti only as a dwarf tree.

The following notes on the birds were made during the hunting trip above described. I kept no record of the Raven nor of the Canada Jay. I have also omitted most of my observations on the birds of Great Slave Lake because that country is so well known that the rough data I was able to obtain seemed to me valueless. On the other hand Aiejean Ti, Diri Ti and Conghia Ti have never been visited by any white man but myself. Jjamba Ti was visited by Prof. Russell in 1894 early in the spring before the arrival of migrants. Therefore it seemed to me that that part of the country was so little known that any information about its birds might be worth preservation.

1. *Gavia immer*. LOON. — First seen June 5 about fifty miles north of Lac de Gras. The first one seen was shot.

2. *Larus argentatus*. HERRING GULL. — Dog-rib name *Maqueau*.¹ Reached Fort Enterprise May 21. Abundant.

3. *Sterna* sp.? TERN. — Dog-rib name — *Awzi maqueau*, literally Barren Ground Gull. First seen on the Barren Grounds northwest of Conghia Ti on June 1. Eggs were found on an island in Snare Lake June 26, some of them fresh, some of them containing chicks, but all fit to eat.

4. *Oidemia perspicillata*. SURF SCOTER. — Reached Fort Enterprise May 15. In the oviduct of a female killed May 24 was a full sized ovum.

5. *Dafla acuta*. PINTAIL DUCK. — Two killed near Fort Enterprise May 26.

6. *Chen hyperboreus hyperboreus*. SNOW GOOSE. — Wavy. Seen near Fort Enterprise May 26.

7. *Anser albifrons gambeli*. AMERICAN WHITE-FRONTED GOOSE. — First seen May 23 near Fort Enterprise. First killed May 27 near Fort Enterprise. This was the common goose about Fort Enterprise both in the timber and further north on the barrens.

8. *Lobipes* sp.? PHALAROPE. — Seen in the Coppermine River not far below Lac de Gras June 9.

¹ Dog-rib words should be pronounced as if they were French.

9. *Lagopus lagopus lagopus*. WILLOW PTARMIGAN.— Dog-rib name — *Kamba*. Winters throughout the timbered country between Edmonton and Fort Enterprise. May 5. Abundant flocks reach Diri Ti in the Barren Grounds. May 7. Concealed feathers on cocks' necks brown. May 10. Cocks white with brown necks. Hens in full winter plumage. Mating commences. May 22. Females begin to change winter for summer plumage. May 30. Both males and females mottled brown and white. Almost in full summer plumage.

10. *Lagopus rupestris rupestris*. ROCK PTARMIGAN.— Dog-rib name — *Kamba*. Winters throughout the timbered country between Edmonton and Fort Enterprise. May 3. First seen on the Barren Grounds — near Diri Ti. May 5. Abundant flocks reach Diri Ti. May 7. Concealed feathers on cocks' necks black. May 10. Cocks white with velvet black necks. Hens in full winter plumage. Mating commences. May 22. Hens begin to change winter for summer plumage. Ova in oviducts three-quarters of an inch long. May 30. Both males and females mottled black and white. Almost in full summer plumage. The first color change in the cocks of both Rock and Willow Ptarmigan appears to be an example of sexual and not of protective coloration. Color changes occur in the cocks more than a week before they occur in the hens. Color changes in the cocks occur simultaneously with mating; they occur in the hens simultaneously with the disappearance of the snow. The cocks which have partly changed color are much more conspicuous than the hens which have not.

11. *Lagopus leucurus leucurus*. WHITE-TAILED PTARMIGAN.— Dog-rib name — *Kamba*. June 4. A male bird seen but not shot in the high almost mountainous Barren Grounds west of Conghia Ti. He was in full winter plumage.

12. *Colaptes auratus luteus*. FLICKER.— Seen near Fort Enterprise May 28. Common from the date when first seen.

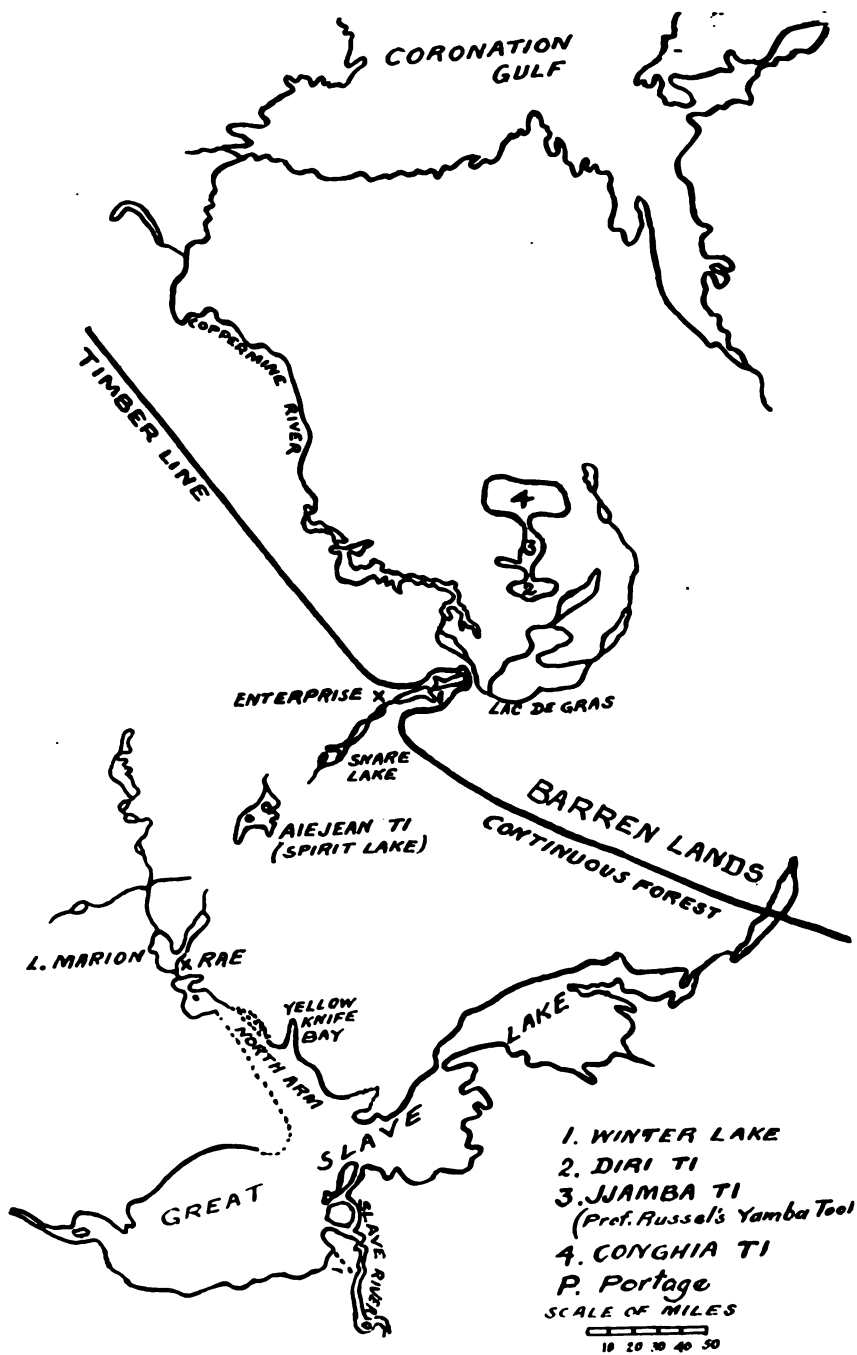
13. *Otocoris alpestris hoyti*. SHORE-LARK.— May 26. Reached Fort Enterprise. June 4. Seen on the Barren Grounds Northwest of Conghia Ti.

14. *Euphagus carolinus*. RUSTY BLACKBIRD.— Dog-rib name *Keauttlesi*. May 13. Reached Fort Enterprise. Not seen on the Barrens. Song: a very sweet, metallic, silvery whistle.

15. *Loxia leucoptera*. WHITE-WINGED CROSSBILL.— April 14. Reached the country just north of Aiejean Ti. The Indians said that these birds do not winter in this country.

16. *Acanthis linaria linaria*. REDPOLL.— May 8. Reached Diri Ti in the Barrens.

17. *Plectrophenax nivalis nivalis*. SNOWFLAKE.— Dog-rib name — *Auwi tsching*. Barren Ground thing. Winter abundantly at Edmonton where they feed, like English Sparrows, on horse droppings. Jan. 30 Tracks seen about dog droppings on the long portage between Slave River and Slave Lake. These birds are rarely seen in the timbered country



MAP OF GREAT SLAVE LAKE AND REGION TO THE NORTH.

between Edmonton and Fort Enterprise, except as migrants. They probably winter in the treeless prairies from Edmonton southward. March 14. A flock seen near Smallpaper's house, North Arm of Slave Lake. March 18. First seen at Fort Rae. May 3. Tracks seen on the Barren Grounds. May 8. Birds seen on the Barren Grounds. May 19. Mating? Flocks abundant.

18. *Calcarius lapponicus lapponicus*. LAPLAND LONGSPUR. — On May 19 and afterwards seen frequently with the flocks of Snowflakes.

19. *Zonotrichia leucophrys leucophrys*. WHITE-CROWNED SPARROW. — May 26. Reached Fort Enterprise May 31. Common on the Barren Grounds one and a half days travel beyond the Coppermine River. Song: like the first two notes of a White-throated Sparrow's. If a White-throat's song is written *sow-wheat, peabody, peabody, peabody*, this bird's song would be written *sow-wheat, sow-wheat*. The Indians recognized this song as belonging to a small bird with a striped head.

20. *Spizella monticola monticola*. TREE SPARROW. — May 23, reached Fort Enterprise.

21. *Petrochelidon lunifrons*. CLIFF SWALLOW. — June 1, seen on the barrens beyond the Coppermine River.

22. *Bombycilla garrula*. BOHEMIAN WAXWING. — Dog-rib name *Krobine*. May 6. Reached Diri Ti. Seen in a grove of spruce and fir two days travel North of the Coppermine River. Between the Coppermine and Diri Ti there is absolutely no timber, when we crossed the Coppermine we carried with us even our kettle sticks.

23. *Planesticus migratorius migratorius*. ROBIN. — Dog-rib name *Goshi*. May 17. Reached Fort Enterprise. Abundant throughout the timbered country. Scarce north of the continuous woods.

The accompanying map is partly from the published maps of the Interior Department of the Dominion of Canada. Great Slave Lake north of Yellow Knife Bay and Lake Marion are so inaccurately drawn there, that I give them from my own courses and estimated distances. Aiejean Ti which is not shown on any published map, I have mapped from my own observations. Diri Ti, Jjamba Ti and Conghia Ti I have copied from a sketch map made by Germain, an old Indian who has hunted this region all his life. Winter Lake is double as I have drawn it. Canadian maps show only the western end of the lower lake.

VROEG'S CATALOGUE.

BY WITMER STONE.

IN the Smithsonian Miscellaneous Collections Vol. 47, pp. 332-347, were published a reprint of the "Adumbratiunculæ" of Vroeg's Catalogue 1764, by Mr. C. Davies Sherborn and comments on the new birds described therein, by Dr. Charles W. Richmond.

It is shown that P. S. Pallas was undoubtedly the author of the Adumbratiunculæ and that many of the new names proposed, antedate those now in use.

Two protests have since appeared, against the adoption of these names as advocated by Dr. Richmond.

Dr. P. L. Sclater (*Ibis*, 1905, p. 490-491) rejects the names because Vroeg's Catalogue appeared before (by a *lapsus calami* he says after) the twelfth edition of Linnæus, with which edition Dr. Sclater begins his nomenclature. He adds however "There is no proof whatever that the 'Adumbratiunculæ' were published at all; they are paged separately from the 'Sale-list.' All we know is that a printed copy of them is attached to Linnæus's copy of the Sale-list, and it was probably sent to Linnæus by Pallas. But it is impossible to say whether the 'Adumbratiunculæ' were issued along with other copies of the Sale-list or were intended by the author for Linnæus's private use only."

Dr. Sclater's position is of course unassailable if we begin our nomenclature with the twelfth edition of Linnæus, but those zoologists who follow this practice are a rapidly decreasing minority and most of us cannot dismiss Vroeg's catalogue so easily. His claim that it is impossible to say whether the Adumbratiunculæ were really published or were attached to other copies of the Catalogue would probably not have been made had he read the statement in the preface relative to them, which is quoted below. Furthermore since Mr. Sherborn and Dr. Richmond published their reprint and commentary, two more copies of the Catalogue have turned up, each with the Adumbratiunculæ attached. One as explained below is in the Zoological Society of Amsterdam, while the other was procured a few years since by Dr. Charles W. Rich-

mond from a dealer in the same city. To Dr. Richmond's liberality I am indebted for the privilege of examining his copy of this rare work.

The second protest against accepting the names in question is by Dr. E. D. Van Oort who discovered a copy of Vroeg's Catalogue in the library of the Royal Zoological Society "Natura Artis Magistra" at Amsterdam and describes it in Notes from the Leyden Museum XXXIV No. 1, pp. 66-69. Dec. 1, 1911.

Dr. Van Oort states that "all the new species of the "adumbratiunculæ" are mentioned, most of them under the same latin names, some under other latin names" in the Catalogue proper which precedes the Adumbratiunculæ and the names in the latter are thus preoccupied by those in the Catalogue.

"These latter names however, cannot be considered because the author of the names and of the descriptions is unknown."

He adds that even if this were not the case the Adumbratiunculæ were anonymous when published and the quotations of Linnæus and Pallas citing the latter as the author do not affect the case.

The latter contention I do not think will be seriously considered as the evidence of Pallas' authorship is perfectly clear. The former contention is distinctly illogical because if the names of the Catalogue are denied recognition in scientific nomenclature they certainly have no status whatever and cannot preclude the subsequent use of the same names, either in the same or another connection.

Since the American Ornithologists' Union Code of Nomenclature does not reject anonymous names, I should be willing to accept the new names which appear in the Catalogue proper and quote them from there rather than from the Adumbratiunculæ if there were no other question involved. There is however, a serious question as to whether the Catalogue is strictly binomial or was even intended to be.

The author states in the preface that the species are arranged under the Linnæan genera and are numbered to correspond with the tenth edition of the Systema Natura, while such species as were not contained in this work are marked with a zero. He further says "Ce qui nous a engagé à en donner des descriptions détaillées à la fin du Catalogue, qui pourront servir à ceux qui se

font un étude methodique de l'Histoire Naturelle." This of course refers to the *Adumbratiunculæ* of Pallas.

The author of the Catalogue evidently used Pallas's names for the nondescripts just as he used Linnæan's names for species already known, but he added miscellaneous explanatory terms indicating sex, age, and condition as well as additional descriptive words, until the result seems to me anything but consistent binomialism. In fact the author probably never meant his names to be so considered, since he refers distinctly to the appended *Adumbratiunculæ* as provided for those interested in the systematic study of Natural History.

The following quotation will show how the technical names are given in the Catalogue. The genera are usually cited in the plural, and the specific names given in parentheses.

- | | |
|--------|-------------|
| ANATES | } Genus LXI |
| EENDEN | |
- 238 BERG EEND. *Mannetje (Tadorna Mas)* Lin. Sp. 3
 239 ZWARTE ZEE EEND (*Nigra*) Lin. Sp. 6
 240 STORM EEND (*Fusca*) Lin. Sp. 5
 241 *Idem't Wyfje (Præcedentis Femina)*
 242 MAK KOVSEER of TURKSCH EEND *Mannetje (Moschata Mas)*
 Lin. Sp. 13
 243 *Idem het KIEKEN (Pullus Moschatae)*
 * * * * *
 256 KOL of STEEN GANS (*Anser*) Lin. Sp. 7.
 257 GROENLANDSCHE BRAND GANS. *Mannetje. (Anser Bernicla*
s. Brenta Mas) Lin. Sp. 11.
 258 TARTARYSCHE GANS *Mannetje. (Anser Tartaricus ferrugineus*
Mas) Lin. Sp. 0.

Should anyone still consider that the names in the Catalogue should be recognized he will find seven which differ from those proposed in the *Adumbratiunculæ*, viz.

Adumbratiunculæ	Catalogue
No. 59* [= 57*] <i>Certhia collaris</i>	= <i>Certhia torque rubra</i> p. 8
113 <i>Loxia tricolor</i>	= <i>Loxia erythromelana</i> p. 13
114-115 <i>Lanius carbo</i>	= <i>Lanius purpureus</i> p. 13
142 <i>Fringilla citrinella</i>	= <i>Fringilla Canariæ subsimilis</i> p. 15
175 (not named)	= <i>Parus aureus</i> p. 18

358 [= 258] *Anser ferruginea* = *Anser Tartaricus ferrugineus* p. 25
 320 *Trynga alba* = *Tringa Leucophæa* p. 32

Unfortunately Dr. Richmond has adopted *Parus aureus* from the Catalogue, and the committee of the American Ornithologists' Union adopted *Tringa leucophæa*. If these names are rejected as I think they must be then *Euphonia aurea* (Pallas) p. 345 of Dr. Richmond's paper will revert to *Euphonia chlorotica* Linn. 1766; while the Sanderling will be known as *Calidris alba* Pallas as given by Dr. Richmond, p. 347.

I can see no excuse whatever for rejecting the names given in the *Adumbratiunculæ* and the changes in nomenclature suggested by Dr. Richmond should be adopted.

Moreover one more seems to be necessary. The Crested Guinea Fowl, *Guttera cristata* usually quoted from *Numida cristata* Pallas Spic. Zool. I, p. 15, 1767, is described in the *Adumbratiunculæ* 1764 as *Meleagris cristata*. This name however is invalidated by *Meleagris cristata* Linn., Syst. Nat. 1758, and I would therefore propose for *Meleagris cristata* Pallas 1764 (= *Numida cristata* Pallas 1767) the name ***Guttera pallasi***.

GREAT AUK EGGS IN THE THAYER MUSEUM.

BY JOHN E. THAYER.

Plate XII.

THERE is at the present time a series of eight eggs of the Great Auk, *Plautus impennis*, in my collection. Three of these were described in 'The Auk' for 1905. The others are those numbered XIV to XVIII in Thomas Parkin's Catalogue of mounted skins and eggs of the Great Auk sold at public auction in Great Britain 1806-1910, from which publication the following notes are taken.

Egg XIV was found in the shop of Mons. Perrot, Naturalist Prépareur at the Museum of Natural History in Paris, by the late



EGG OF THE GREAT AUK IN THE TRAYER MUSEUM.

THE
SUN
SHINE
ON
THE
MOUNTAINS

Sir William Milner who purchased it November 23, 1847, for 200 francs. After his death the egg was purchased by Mr. T. G. Middlebrook, April 23, 1895, for £189.

Egg XV was originally obtained in Iceland about 1830 by a ship owner of St. Malo who bequeathed it to Comte Raoul de Baracé. Upon his death it was secured by Baron d'Hamonville in March, 1887. On June 25, 1895, it was offered at auction in London and was bought by Messrs. Jay & Co. for £173 5s and two years later July 27, 1897, was again sold to Mr. T. G. Middlebrook for £168. It was figured in the *Memoirs of the Société Zoologique de France* 1888, plate 6, fig. C.

Egg XVI from Iceland, was sold by Frederick Schultz of Dresden to Mr. Hugh Reid, May 23, 1841. The same year the latter sold it to Mr. J. H. Tuke for £2. 6s. and at the executors' sale April 20, 1896, it was purchased by Mr. Heatley Noble for Mr. Wm. Newell for £168. This egg is referred to in Hewitson's *Coloured Illustrations of British Birds* 1846, Vol. II, p. 413, and is shown in the accompanying plate. (Plate XII.)

Egg XVII one of three which were in the collection of the Vicomte de Barde for some thirty years prior to 1825 when they went with the rest of his collection to the Boulogne Museum. The curator of this institution exchanged them to Mr. James Gardner Jr. for an Ostrich skin. Mr. Gardner brought them to London and sold them to Mr. F. H. Potts, who after disposing of two of them at auction May 24, 1853, sailed to New Zealand taking the present egg with him. He died in 1888 and about 1891 the egg was purchased by Mr. Henry O. Forbes, curator of the Canterbury Museum, Christ Church, New Zealand. It was returned to England and was in the collection of Mr. Leopold Field from whom it was purchased by Mr. Rowland Ward. It was offered at auction April 13, 1897 and was bought by Mr. T. G. Middlebrook for £294. Probably no bird's egg has ever travelled so widely!

Egg XVIII has the same early history as No. XV and was figured by the Baron d'Hamonville, Plate 6, fig. B, of the paper already referred to. It was purchased, July 19, 1899, by Mr. T. G. Middlebrook for £315, but on the dispersal of the Middlebrook Museum January 30, 1908, it brought only £110, and was bought by Mr. Rowland Ward.

THE LEAST SANDPIPER DURING THE NESTING
SEASON IN THE MAGDALEN ISLANDS.

BY ROBERT THOMAS MOORE.

Plates XIII, XIV.

THE habits described in this paper were noted in the Magdalen Islands, Gulf of St. Lawrence, during the period, June 17 to July 2, 1911. Most of these days were spent in the vicinity of Grosse Isle, the fishing village at the northeast end of the "Lagoon." This peculiar body of water, twenty-five miles long by two or three wide, is bulwarked against the sea on both sides by a narrow stretch of dunes, wind-tossed mile after mile to weird and mammoth shapes of sand, but here and there blown flat into low areas. One of these just east of Grosse Isle has taken the form of a salt marsh and has become the chief nesting-locality of *Pisobia minutilla* for the eastern portion of the islands.

The marsh itself is a large one, for here the distance from gulf to lagoon is over a mile, the whole of this width, save for the dunes on the gulf-side, being covered by its surface. In the other direction it is irregular, being invaded here and there, and in places almost bisected, by tongues of solid earth, sufficient to support a growth of stunted spruces and bayberries. On our arrival no conspicuous flowers flaunted bright colors in any part of this area, for the Blue Flags had not yet bloomed on the edges and the Buckbeans (*Menyanthes trifoliata*) so profuse in a deeper marsh at East Point, were entirely absent. The whole surface was sombre, absolutely unrelieved, all in tones of gray and dark green. A more dreary waste of water and muck can hardly be imagined! Fully a third is water distributed in shallow patches, the rest water-soaked hummocks, dry only on the grassy tussocks that tuft the marsh here and there. On these hillocks the Wilson's Snipes conceal their nests, but the Least Sandpipers place theirs in tufts of short marsh grass surrounding the larger tussocks.

As one slops over the marsh the little Sand-peeps begin to pipe anxiously and soon one whirls up into the sky to repeat over and



1. ADULT LEAST SANDPIPER, IDENTIFYING NEST CONCEALED BY STICKS.



2. YOUNG LEAST SANDPIPERS ABOUT THREE DAYS OLD.

2000

over a pathetic little flight song. By this time the more abundant and more vociferous Wilson's Snipes are hurtling about in tumultuous excitement, those, concerned with young near at hand, making spectacular dives to earth, there to grovel and flutter, while others are cutting eccentric figures overhead and ever and anon sharply plunging down the skies to the accompaniment of their wild wing-songs. Other species, too, are demanding attention: the Savannah Sparrows buzz on all sides, Rusty Blackbirds hoarsely rasp from the marsh-edges, Blackpolls clink their pipes in the bayberry clumps, and Fox Sparrows innumerable bell from the surrounding hills. Nevertheless the Sandpiper and the Snipe seem the rightful owners of the marsh, the only ones that require just such a wet situation and no other for the setting of their homes.

All told we found five nests of the Least Sandpiper, four of them close together at the southwest end of the marsh, in an area not over a hundred yards in diameter. The fifth nest was discovered by my companion, Mr. Wm. L. Baily, in the damp end of a grassy field, where it borders the marsh along its southern margin. All of the nests were in damp situations and those in the marsh were on ground so sponge-like that one could not kneel without getting wet. Adequate protection from the dampness was afforded three of the marsh nests by a layer of dead, chocolate-colored leaves, presumably secured from the bayberry bushes. The lining of the fourth nest consisted of narrow strips of glistening white Eel-grass, *Zostera marina*, which not only bottomed the nest-concavity, but also curled its surplus of satin strands out and around the grassy tuft into a most conspicuous and charming decoration. Conspicuous as it was against the dark background, it was not absolutely tell-tale, for similar curls were scattered about the neighborhood and decreased the danger of discovery. The field nest was lined with grass which harmonized perfectly with the standing grasses that met above and made detection difficult. The customary lining seems to be leaves, and nests, so lined, though couched in short grass and open to view, are in reality well-concealed, for the chocolate-blotched eggs are almost invisible in their dark setting.

Four eggs were ultimately the complement of all the nests, though one when discovered, contained but a single egg. These were indistinguishable in shape and size, but varied considerably in

amount and arrangement of markings. One set was so heavily blotched with varying shades of dark brown that the background was hardly visible at any point, while a second set was blotched only about the larger end and spotted on the sides and small end. The general appearance of the second was buffy, while that of the first was chocolate. Still a third set differed from these in having two dark eggs like the first and two light like the second.

All four of the marsh nests were found on June 17, when three possessed the full complement of eggs. By June 22 the nest, which had on the 17th but one egg, now contained four. On this same date, the 22nd, eggs of one of the marsh nests hatched and these chicks left the home before the morning of the 24th. The 24th also witnessed the discovery of the field nest, which at that time contained four eggs somewhat incubated. These hatched between June 25th and July 1st. It appears from this that some of the females must have begun laying as early as June 5, and on the other hand, one certainly did not start much before the 16th. It must be remembered that this season, as far as the Magdalen Islands were concerned, was late and unusually wet. Unfortunately I have no dates, other than those given above, from which to calculate the length of the incubation period. All that I can definitely assert is that it lasts longer than seven days. Not until the clutch is complete does incubation begin, for all the eggs in one nest hatched within a period, not longer than twenty-four hours. There is a possibility that two broods are reared, since one female, collected on the 24th after she flushed from the set, not completed till the 22nd, exhibited a red-centered condition of four of the ovaries, which made the laying of a second set potentially possible.

The young are certainly precocious, leaving the nest at least by the first day after birth and, thereafter, being able to find their food and take care of themselves. At sunset, June 22, the first egg of one clutch hatched before my eyes and forty hours later on June 24 all of the young had left the nest. The parent who had brooded them was walking about, within a few feet of the deserted home but despite diligent search, no trace of her young could be discovered. At this early stage of development their various shades of cinnamon and brown render them inconspicuous and their small size completes

an equipment sufficient for absolute safety, as long as they remain in the dark marshes. That they do not stay there long, I feel confident, for a parent and two young, not over three days old, were discovered by us on July 2 in a stretch of sand, bordering the beach and a long distance from a possible nesting-locality. Here against this white background, relieved only by spikes of grass, they were very conspicuous and the lack of protection made the parent frantically anxious. Piping a frenzied flight song, she whirled over our heads and dashed to earth, there to trail excitedly in a vain effort to confuse attention. To protect, to warn, to guide in the search for food, these seem to be the chief parental functions at this stage. That the young are able to find food and water for themselves, we had evidence the next day, for these two were kept over night and, when they were let loose, ran at once to a stream of water coursing across the beach, boldly waded in and drank deep. Quite as adept they were in finding food. Our attempts to recatch these nimble youngsters brought to light a use of wing, I would not have credited to two-day old chicks. At the moment of imminent capture they would raise their featherless flippers and flap them vigorously, as if anticipating a surer method of escape in the near future!

Interesting as this precocity was, it did not appeal to me so much as the guileless disposition of the adult birds. From a customary gunner's experience with Shore-birds I expected these abused Sand-peeps to be extremely shy in their northern homes. The truth was a revelation of gentleness of character, apparently inherent in the whole species, in astounding contrast with the bitter treatment, accorded them on our southern beaches. Never have I known any birds more docile, more absolutely free from the resentful instinct, than these wee fluffs of life. My caged canary when suddenly disturbed, pecks and scratches, but these wild Sand-peeps permitted themselves to be caught and handled without once resorting to natural weapons of defense. Indeed all their actions about the nest in the presence of human beings indicate a nature at once bold and gentle, fearless and tame, combined in a disposition about as lovable as that of any wild creature I know, and this despite the fact, that they are as consistently "collected" on the nesting-grounds, as they are shot on the migration beaches.

It is surprisingly easy to get on friendly terms with them and, once a friendly relation is established, the revelation of life-secrets follows as a natural consequence.

The birds do not flush directly from the nest like many ground-nesting species, but invariably walk or run fifteen feet or more, before flying. This habit was characteristic of all five brooding birds, particularly at the time of nest-discovery. Later it was modified by increasing familiarity, indeed two birds became so tame that they would not leave, unless threatened with foot or hand. With them flight was a premeditated action, rarely incited by fear. The customary response to the stimulus of man's presence was as follows: At a distance of fifteen feet from me the brooder would raise itself an inch from the nest and watch my approach. If my movement was extremely slow, it would drop back on the eggs, but at my third or fourth step later would rise again and walk a foot away, stop, and gaze at me doubtfully. This action was performed in erect attitude with no attempt to crouch or conceal. The next move was to run swiftly off fifteen or twenty feet and launch into flight (sometimes accompanied by song), provided it was the initial meeting. If she was used to me, she would circle about among the hummocks approaching again from various directions. At this point, if I remained motionless, she would invariably return by short running hitches and boldly gather the eggs under her. My next step would start her again and a sudden movement would produce one of two results: Either she would flutter up a few feet into the air, like a slow-flapping moth, and drop again a few feet ahead, or else she would trail and vibrate the "broken wing." All the birds used the latter trick at one time or other, but they did so sporadically, rarely employing it at the moment of leaving the nest. A marked feature of this manoeuvre was the wide-spreading of the tail fan-shaped, showing a conspicuous amount of white. A supplementary action was to grovel in some mud-depression and flutter the half-shut wings rapidly for several seconds, or else to slide slowly forwards on the belly. During this performance a high call-note was constantly uttered resembling the cries of young birds. (Call record No. 1.)

So far the actions described were common to each Least Sand-

piper and would incline one to believe they lacked individuality. Quite the opposite was true; each one was highly individualized, so that it could be distinguished easily by some marked trait. For instance, one bird on leaving the nest invariably ran directly towards me, no matter from what direction I came or how close I was, and walked about my feet in imminent danger of being trod

SONG RECORDS

1. *Presto.* $\text{♩} = 120$ 2. $\text{♩} = 120$
 $28va$ $28va$ *trm.*
 mf
 3. *Presto* $\text{♩} = 120$
 $28va$ mf
 4. $\text{♩} = 120$ $28va$
pa-dee pa-dee pa-dee pa-dee pa-dee pa-

CALL RECORDS

1. $\text{♩} = 100$ $28va$ 2. $\text{♩} = 130$ $28va$ 3. $28va$ 4. $\text{♩} = 210$ $28va$
 f f f f *trm.*
 5. $\text{♩} = 210$ $28va$ 6. $\text{♩} = 210$ $28va$ 7. $48va$
 p *trm.* p *trm.* p

upon, if I confined my attention to the camera. Though two others were much tamer, neither showed this surprising trait. The action was not threatening, but anxious or merely nervous. A second bird developed a habit of lifting the grasses, we trod down about its nest, a third was quite shy and two others were extremely tame. Furthermore the flight songs of the three brooders I heard sing, were characteristically different and easily distinguishable.

Discovering how guileless the two tame parents were, I naturally devoted most of my time to them. One was the owner of the Eel-grass nest in the marsh, the other of the grass nest in the field. This bird hereafter designated the "marsh bird," was disclosed to us by a village boy, who was trying to catch her with his cap, a trick which he probably would have accomplished. Even while

Mr. Baily was focussing his camera within three feet of the nest, she walked up to it and covered the eggs as unconcernedly, as if we were miles away. There were three of us present, talking and conversing, yet she walked right up to our feet and slipped between the tripod legs. Indeed when a time picture of the eggs was required, one had to prevent her from walking in and spoiling the picture. That she was perfectly at home with us, was proved by the easy, unconscious attitudes she took, often preening her feathers or stretching her wings in the most serene and graceful manner. One foot held up the wing, the other balanced the bird. Poising in this airy fashion she seemed some automaton of a fairy world, rather than an earthly intelligence. (Plate XIV, fig. 4.)

And she was very intelligent! On June 20 I watched her solve three problems, one provided by the crowded condition of her nest, the others by human interference. Her custom was to run straight into her nest without stopping at the edge. Without hesitation she would step directly on the eggs, each foot on an egg, and then, try to slip the feet between them before settling. But the eggs were so large and the nest so small, that there was little room for her feet. The right foot went down quite easily, but when the left tried, it squeezed and shoved in vain. Realizing that she would not succeed in this way, she made use of her bill, inserting it between the offending eggs and turning the small end of one around. Then she shoved the lining away to the side of the nest near the small end and having made a hole, inserted the foot. Her next move was to coerce a refractory egg under her feathers and then to tear out a piece of Eel-grass that annoyed her. At length content she sank into a wide-spread fluffy condition, the bill sunk, the eyes relaxed, and assumed that glazed appearance, which denotes a brooding bird unconscious of surroundings. (Plate XIV, fig. 3.) And all this happened while my head was within three feet of hers!

It seemed a pity to disturb her, but I had my own problem for her. Forcing her off, I filled her nest full of sticks and waited. Immediately she came up and ran right over the top of the nest. Stopping on the opposite side, she stood stock still a full minute unable to grasp the changed conditions. Then, for the first time



3. ADULT LEAST SANDPIPER, INCUBATING. UNCONSCIOUS ATTITUDE.



4. ADULT LEAST SANDPIPER, STRETCHING WING.

this bird evinced active concern, for she began to run in and out of the tussocks, searching frantically in all directions, now and then halting to get bearings and constantly giving vent to that pathetic little call. (Call records No. 2 and 3.) Fearing she might abandon the home, I thought to relieve her, when at that moment she ran up to the sticks again, glanced at a tuft of grass four inches to the right, which seemed to be a landmark, gazed at the sticks searchingly, and at length recognized the nest. Instead of trying to lift the sticks out, she attempted to shove under them, but found them too bulky to move. So she pried them up with her bill, gradually working into the nest as she pried. (Plate XIII, fig. 1.)

Again I flushed her and determined to make as hard a problem as possible. First, I stamped down the tufted hillock which threw shadows from the setting sun and next, covered the nest completely with a mass of yellow straw. Again she overran the nest and this time seemed completely bewildered. Astonished by the disappearance of the landmark, she ran swiftly away, as if bewitched, and crouched flat in a mud-hole, her whole attitude being one of fright. But it was not long before she adjusted her ideas to the new conditions, ran up to the straw, inserted the bill underneath, and crept under. Her body struggled under the burden and disappeared; the straw shook convulsively, evidence that the home was being put to rights. For an instant it seemed she would walk off with the new roof, but finally the struggles subsided and a head popped out with a frightened look as much as to say: "What new plots are you concocting now?"

In order to secure photographs I had to disturb her a number of times and the last time, she retired five feet to the east and without warning shot up into the sky. As she flew, she sang the flight song. (Song record No. 1.) I hoped she would return, but no, she kept on ascending and singing as she climbed, repeating the song over and over with but slight pause. A certain wildness about it betokened final farewell and it certainly was final for that afternoon. Two days later contrary to my fears, I found her again on her nest, a returned songster.

This day the 22nd, I determined to catch her in order to ascertain positively that there was no webbing between the toes. Kneeling

on the ground, I gradually moved my hand through the short grass. Each time she rose from the eggs, the hand halted and waited for her to drop again. Sometimes I feinted with the other hand to draw her attention. As the hand got nearer, her breathing became heavier and the breast feathers palpitated visibly. At length my first finger touched her neck and she raised slightly only to sink again, when it stroked her. A minute later her neck was almost surrounded and she resented the uncomfortable feeling only by hunching upwards. Then, just as the fingers were about to close, she slipped out from under and was free. Keeping my hand circled about the nest I waited. Almost instantly she returned and crept under my hand. I closed the fingers and lifted her for examination. She endured it patiently and, when I let her go, flew but a short distance, straightened out the ruffled feathers, and in three minutes was back on the nest!

In the midst of this operation one egg hatched before my eyes. It broke open violently, as if by explosion, the two sections shooting to opposite sides of the nest and the new youngster burst valiantly into the world. Immediately the wet wings began to strike out vigorously and tossed the smaller section of the shell out of the nest. The mother was manifestly perturbed about her new baby, plainly concerned at my presence on such an important occasion. She rushed up to the nest, hesitated uneasily, constantly uttering solicitous call-notes (Call record Nos. 4, 5 and 6), and finally brooded. Entering she stepped right on the head and neck of the precious new-born, just as she had trod on the eggs previously. Perhaps she would not have been guilty of this flagrant misconduct, if my presence had not embarrassed her. At this moment I left her and, when I returned, found her walking about some feet from the nest. Both sections of shell had disappeared and could not be found, though I searched long. Two days later the nest was empty, the young undiscoverable, but the wee parent was still walking about as tame as ever. Again I almost caught her, getting my hand within six inches of her. Whenever I started the imperceptible stalking motion, she always acted as if mesmerized and the recovery from the state of seeming paralysis was announced by tremulous call-notes.

The field bird, whose nest was discovered by Mr. Baily June 25

in a damp grassy field, was almost as tame as the marsh bird. This being the first day of sunlight we had enjoyed with these birds, I determined to catch her too and secure a good photograph. With the camera set up five feet from the nest, a ten foot hose attached, and the bulb in my left hand, I proceeded to work my right hand toward the bird. From the start she proved to be more nervous than the marsh bird and, when my hand got close, fluttered off precipitately. Then, I curved the hand about the nest hoping she would creep under it as the marsh bird had done, but she began to pull at the grasses, we had tramped down in the vicinity. At first this action had been merely protective, for she began it sitting on the nest, lifting the blades and making them assume their former upright position of concealment. Now on the contrary the act was a nervous one, for she straightened grasses some distance away and always did it, when I circled the nest with my hand. Each time I moved away she would return and incubate. It was evident that there was more chance of catching her by moving the hand towards her than by waiting for her to return. Proceeding in this fashion after an hour's effort I accomplished the trick. She struggled violently, but did not attempt to pick my hand.

Like the other Least Sandpipers she possessed a flight song and gave snatches of it from the ground. Once she rendered it entire, within a foot of my hand! It consisted of a series of trills, which ascended just one octave on a minor chord. (Song record No. 2.) The tone quality was pure and sweet and rendered pathetic by the minor chord, which served as its medium. This, however, is distinctly a flight song and, I believe, delivered from the ground only under spur of excitement. Slipping out of my hand a moment later she uttered it with a wild frenzy, as she whirled excitedly aloft. Out over the Lagoon she went, farther and farther, higher and higher, till her wee form vanished from sight, but for several minutes afterwards that pathetic ascension of sound reached my ears, constantly leaping upwards, only to return to its starting point and leap again. Three minutes later I heard it once more approaching and shortly after, she pitched down near the nest and in a few seconds was once more brooding, as if no untoward incident had happened!

Records of the flight songs of three of these brooding birds I possess and each in its notes, progressions, and even time is totally different from the others, and yet, without sight of the bird, I would instantly recognize them as songs of the Least Sandpiper. This is due to the fact that the quality of tone is constant in all being pure and sweet, the tempo is always extremely fast, the notes being delivered with great rapidity, and the pitch high. Trills and runs are characteristic and make an additional recognition-quality. All of this is shown by the records which follow:

No. 1 is the song of the marsh bird I caught, No. 2, the song of the field bird, and No. 3 belongs to a bird I was compelled to shoot, as described later. All three were rendered by incubating birds. Songs No. 1 and 2 were heard on three or four occasions each, and No. 2 was noted over and over again, both from the earth and the sky, and I have no evidence to suggest that this bird or the other two sang other songs than their own particular ones, or that they varied them to any noticeable degree. After the young were out of the nest the field bird did alternate with song No. 2, a long repetition of two call-notes (Song record No. 4) as noticed later, and changed from call-notes to song and from song to call-notes without a second's break, and yet these call-notes were so distinctly such, that they need not be considered in a discussion of the songs.

Two marked qualities the songs possess and they are exhibited, in one case more and in the other less, by the call-notes, that is they are tremulous and they are pathetic. The former is most prominent in the calls, but is at times present in the songs. On several occasions they were rendered within a few feet of my ears and at this close range trembled or quivered markedly. This tremulous quality is precisely the best medium to convey anxiety and it was most strongly present, when the brooding birds give evidence in other ways of possessing that emotion; for instance, when the marsh bird could not find her covered nest and when she found my hand encircling her nest at the instant her first chick was born. This quality was also conspicuous at the initial discovery of each nest. In the flight songs, when delivered at a distance, the tremulous effect could not be so easily distinguished, but when they were given on the ground at moments of anxiety, they were strongly charged with it.

The second quality, that of pathos, was perhaps the chief characteristic of the songs and to a lesser extent of the calls. An examination of the musical structure reveals the reason for this. All three songs are definitely related to the minor key. Song No. 2 is distinctly in the key of A minor, song No. 1 in the key of F minor, and No. 3, though beginning in E^b major, drops its "third" a half tone at the end, as if inclining toward the minor effect. So too, even the call records, No. 4 and 5, are distinctly minor, consisting of two notes, B and G[#], which limit the intervals of a minor "third." It is a matter of popular knowledge that sad or pathetic songs are generally written in minor keys and so it is not surprising to find these pathetic bird songs rendered in just the best way to produce such an effect.

The finest bit of singing I heard occurred at the close of the nesting season. Returning from Bird Rock, July 1st, we passed by the nest of the field bird, which had sung song-record No. 2. As we walked along this flight song piped overhead and was sung over and over again with a tremulous zest. Alternating with it, was repeated for long intervals an excited call of two notes. We glanced up and for the first time beheld two adult Least Sandpipers together! Alternately they flapped and soared and circled about in a rapturous fashion. For several minutes the alternation of song and call continued without break of any kind. Sometimes the song was given three times consecutively and followed by as many as thirty or forty repetitions of the call, this in turn to be followed by the song again. The second note of the call was strongly accented, as indicated by the mere musical outline above (Song record No. 4). This call of two notes precisely corresponds to Nuttall's description of the "collecting cry of the old birds calling together the brood," which he rendered into the syllables, "pé-dée, pé-dée, pé-dée, etc." The accent gives it an emphasis of joy not to be misunderstood and the whole performance is decidedly ecstatic. Turning to the nest I found it, as I suspected, empty and I was willing to believe that the unusual ecstasy was not unrelated to the passing of the great red-letter incident in the rearing of young, the leaving of the nest.

Focussing my glasses on the rapturous pair, I confirmed another supposition of mine, that only one bird was doing the singing.

And this brings me to the statement of a conclusion, the proofs for which I wish were more adequate, and yet they are adequate enough, I think, to warrant the publishing of what, if true, is a most unusual trait in the life-history of this species. On the 22nd of June I suddenly realized that in all my prolonged visits with these birds, lasting for several hours at a time, I had not once observed mates of any of the five brooding birds. It seemed exceedingly strange when the birds were so repeatedly disturbed, that the mates should not be called in to protest, particularly as both sexes of the other shore birds nesting in the vicinity, the Spotted Sandpipers, the Ring-necked, and the Piping Plovers were always about their nests. From this day on I made particular search for these mates, but without success. Neither about the nest, nor in the great marsh, nor even on the nearby beaches did I once discover a single Least Sandpiper, other than the five, which, despite frequent visits, kept on or close to their respective nests. By the 24th I had come to the natural conclusion that the absent mates were males, although this involved the belief that the singing was being done by the females. For some days it had been plain beyond question of doubt that the brooding birds of at least three of the nests were always the same ones to be found each time on their respective nests, for each of these was too strongly individualized by various traits to be mistaken for other individuals. It was also absolutely certain that these incubating birds were doing all the singing we heard. On this day, the 24th, I shot the bird, which sang song record No. 3, immediately after I noted her flush from the nest, sing, and return to brood. That evening Mr. Baily dissected her under my observation and found her to be a female! On the following day I made a more determined search than ever for the "males," as we now denoted them, and under this date I find for the *third* time in my journal the same note: "Have not been able to locate sitting birds' mates anywhere, not even on the beaches"! Not until July 1, when all the young were out of the nest, did we observe a single mate and that was on the occasion noted above, nor after this did we again note two adult Least Sandpipers together!

From these facts and observations it seems to be a safe assumption that all of the incubating birds were females, that the females

did the singing, and that the males spent the day hours some distance from the marsh-homes and, if they incubated at all, did so at night. Two facts remain positive: that the incubating birds did the singing and that one female both incubated and sang!

I cannot close this paper without adding a just tribute to the song of these wee sprites. Of course, it cannot compare in power, melody, and rich depth of tone with the song of the Fox Sparrow, the prima donna of the Magdalens, nor can it claim attention beside the productions of the Hermit Thrush and the Song Sparrow, which however are rare, at least in the eastern part of the islands. But after these three major songsters are disposed of, it will be found to rank high up, if not at the head of those that are left, the Rusty Blackbird, Savannah Sparrow, the Kinglets and nearly the whole group of Warblers. Only two of the minor musicians present in the Magdalens, the Water Thrush and the Horned Lark, can equal the effusion of the wee Sandpiper. This is a remarkable fact, when one remembers that none of the other shore birds, at least those summering in the Magdalens,— the Ring-necked and the Piping Plovers, the Spotted Sandpiper, and the Wilson's Snipe — utter anything that even by courtesy may be termed a song! The Sand-peep, alone of his tribe, dares to contest with the real songsters and does so creditably. Indeed, after that one glorious song of the Magdalens, the Fox Sparrow's, is excluded, I will always remember longest and hold dearest this sweet rippling sky song, that somehow, perhaps on account of the aerial quarter from which it comes, perhaps on account of the sweet character of its author, touches some chord within me nearer to affection than many of the bird-songs, held up for unquestioning admiration, are able to reach.

FURTHER NOTES ON THE FRUIT-EATING HABITS OF
THE SAGE THRASHER IN THE YAKIMA
VALLEY, WASHINGTON.

BY CLARENCE HAMILTON KENNEDY.

IN 'The Auk' for April, 1911, I reported the extensive damage done by Sage Thrashers (*Oreoscoptes montanus*) in the vineyard on this ranch. My observations and efforts to lessen the damage done were continued through the past season and are of interest.

While occasional Thrashers were seen on the ranch during the spring and early summer months, they did not appear this season in numbers until the middle of August when the Campbell's early grapes were ripening. For some reason they did not come early enough this season to eat the blackberries and raspberries. However, when they did come in August they were as numerous as at any time during the previous year.

Anticipating the damage they might do, I combated them in two ways.

First, the summer pruning to remove the extra foliage was omitted on those varieties, which had suffered the most damage the year previous, for I had noticed, that more damage had been done on the exposed bunches, than on those which were hidden by the foliage. While the Thrashers attempted to do as much damage as in the previous season, this extra foliage effectually protected nearly all of the bunches, and concentrated the damage on the few that were exposed. It was cheaper to sacrifice these altogether to the Thrashers, than to trim a few damaged berries from each of many clusters. The serious fault of this measure was that it delayed the ripening about ten days, which reduced the value of the crop. This method saved the Campbell's Early, which is the first variety to ripen, but it failed to save the Tokays and other *Vitis vinifera* varieties, which began ripening three weeks after the Campbell's Early.

To save these I began the second method, namely killing the Sage Thrashers with a shotgun. The year previous I had tried shooting a few to see if they could be frightened away but failed to intimidate them. They are apparently not quick or intelligent birds.

This year I shot to exterminate those in the vineyard and I must say that I was surprised at the quick results. The following table shows the rapidity with which they were destroyed.

Sept. 7, 1911 — 14 killed	Sept. 11 — 1 killed
Sept. 8 — 4 killed	Sept. 12 — 1 killed
Sept. 9 — 2 killed	Sept. 13 — 2 killed
Sept. 10 — 1 killed	Sept. 14 — 1 killed

After Sept. 14 no more were seen. During the first day's shooting they were easily approached but after that the few remaining birds were very wary. These on being disturbed would fly up on posts and then, seeing the gunner approach would dive into the grape foliage and escape by running on the ground, or by short flights from vine to vine close to the ground. The small number killed and the speedy and complete disappearance of the species seemed to indicate that they are very local in their individual ranges, and that these were living altogether in the vineyard during their depredations.

While the Thrashers are silent birds at this season, I did hear two short songs and one whispered song, also a cluck was given sometimes, when they were startled.

The following table gives the contents of stomachs examined: —

<i>Fruit in stomach</i>	<i>Insects in stomach.</i>
1 None	None.
2 Green grape, red grape.	Locust, several ants.
3 Black grape.	Small ground beetle, 3 white gravel.
4 2 black grapes.	Locust, numerous ant remains.
5 Black grape.	
6 2 black grapes	
7 Green grape, red grape	Locust, 6 ants.
8 Black grape	Locust, small wasp, small beetle.
9 Black grape.	Three black ants, minute beetle.
10 Black grape	Beetle, wasp.
11 Black grape	4 ground beetles.
12	Large ground beetle.

The omission of summer pruning is not a satisfactory method of saving the Campbell's Early grapes as the later ripening involves a loss of about 30% in value, as during this ten days delay the grapes drop in market price from three cents a pound to two cents. Therefore, if the Thrashers have to be killed before the

season is over, because of their molesting the later varieties it would seem quite as justifiable to shoot them early enough to save the Campbell's Early grapes also. It seems a pity to be compelled to kill such wonderful singers as Sage Thrashers, birds, which, were it not for their grape eating habits, would undoubtedly be very beneficial, but no better method occurs to me and it is difficult to stand by and not try to save the grapes.

In the few isolated vineyards in this lower Yakima Valley the killing of the Thrashers, which infest them during the grape season would evidently save the grapes and, because the Thrashers do not fly about the valley in flocks, only the few which live in each vineyard would have to be destroyed. This would save the grapes, and would probably not appreciably effect the total number of Thrashers inhabiting the valley.

CERTAIN PHASES OF THE THEORY OF RECOGNITION MARKS.

BY W. L. MCATEE.

THE paper by Dr. John Treadwell Nichols on recognition marks in certain species of birds, published in the preceding number of 'The Auk' ¹ was read at the Philadelphia meeting of the American Ornithologists' Union in November, 1911. The theory of recognition marks was then unfavorably commented upon by several speakers, of which the writer was one. He now wishes to put in print a series of questions, which must be satisfactorily answered by those who believe in the great importance of directive markings if they would persuade others to share this belief. A statement of the general theory ² of recognition marks will be useful and to

¹ Vol. XXIX, No. 1, Jan., 1912, pp. 44-48.

² It should be noted that this theory covers both "banner marks and "sight clues." H. C. Tracy in 1910 (Univ. of Calif. Publ. in Zoology. Vol. 6. No. 13, Dec. 28, 1910) separated these classes of markings, discrediting the crude interpretation of the former, but claiming utility for the latter.

avoid, misinterpretation we quote a mature expression of the theory by its originator and chief developer, Dr. A. R. Wallace.¹

"If we consider the habits and life-histories of those animals which are more or less gregarious, comprising a large proportion of the herbivora, some carnivora, and a considerable number of all orders of birds, we shall see that a means of ready recognition of its own kind, at distance or during rapid motion, in the dark or twilight or in partial cover, must be of the greatest advantage and often lead to the preservation of life. . . . Some means of easy recognition must be of vital importance to the young and inexperienced of each flock, and it also enables the sexes to recognize their kind and thus avoid the evils of infertile crosses; and I am inclined to believe that its necessity has had a more widespread influence in determining the diversities of animal coloration than any other cause whatever." (p. 217.)

A weighty objection to this hypothesis, as it is indeed to most hypotheses coming under the theory of natural selection, is that the need of a certain color, or form, or other detail of animal anatomy either internal or external, can in no wise be advanced as a cause of the development of something to satisfy this need. In the words of D. O'Phace, Esq.—

"Some flossifers think that a fakkilty's granted
The minute it's proved to be thoroughly wanted."

This point need not be labored, for it is evident that all species have needs that have not been satisfied. On the other hand most species have developed characters that are in no way useful; indeed this is sometimes carried to such a degree that the character becomes a handicap. These things are not called forth by necessity; what reason is there to believe therefore that the particular characters known as "recognition marks" have risen in response to a definite need?

Continuing the quotation from Wallace:

"Among birds, these recognition marks are especially numerous and suggestive. Species which inhabit open districts are usually protectively coloured; but they generally possess some distinctive markings for the purpose of being easily recognized by their kind,

¹ Darwinism, 1896.

both when at rest and during flight. Such are, the white bands or patches on the breast or belly of many birds, but more especially the head and neck markings in the form of white or black caps, collars, eye-marks or frontal patches. . . .

"Recognition marks during flight are very important for all birds which congregate in flocks or which migrate together; and it is essential that, while being as conspicuous as possible, the marks shall not interfere with the general protective tints of the species when at rest. Hence they usually consist of well-contrasted markings on the wings or tail, which are concealed during repose but become fully visible when the bird takes flight. . . .

"Most characteristic of all, however, are the varied markings of the outer tail-feathers, whose purpose is so well shown by their being almost always covered during repose by the two middle feathers, which are themselves quite unmarked and protectively tinted like the rest of the upper surface of the body." (p. 222.)

Proceeding with the questions previously referred to:

Why, if recognition marks are so important as a means of keeping members of a flock together, do so many species of birds possessing this type of coloration, migrate by night as well as by day, or even migrate chiefly by night?

Wallace, asserts that these marks "are very important for all birds which congregate in flocks or which migrate together." Yet practically all of the smaller migrants do most of their traveling at night, when recognition marks can be of little or no service. Even the bulk of the larger species, as Ducks, Geese and other waterfowl, which do much traveling by day, have no difficulty in making extensive migrations at night and in some localities they habitually choose night-time for their lesser journeys.

It is worthy of note that the principal exceptions to the rule of night migration among the smaller birds, viz: Swifts, Nighthawks, and Swallows, have one characteristic — the habit of feeding while in full flight — in common. There is little doubt moreover that this habit is the direct cause of their diurnal migration; that is to say, recognition marks probably have nothing to do with it.

If recognition marks are so valuable as a means of keeping members of a species together, why is it that in the case of certain species, every member of which has the same directive coloring, the young birds and the adults migrate in separate flocks?

It is evident that in such cases (frequent among Shore-birds) that some condition is more important than the possession of the regulation directive marks of the species.

If recognition marks are so important to flocking species, why is it that their usefulness is swamped, as it were, in many cases, by the flocking together of distinct species?

For instance during the only time that Shore-birds, Ducks, Geese, Swallows, Sparrows and Warblers flock, distinct species show no aversion to flocking together; in fact they habitually do this very thing.

Why do directive colored species ignore the hall mark of their kind, and crossmate?

This is done promiscuously and freely by Anatinæ; other examples are *Vermivora* and probably *Colaptes*.

We may well inquire also why certain very closely related species do not have recognition marks? For instance, *Sturnella magna* and *Sturnella neglecta*; and certain species of *Empidonax* and *Vireo*.

Species in which all of the individuals are not colored alike, or do not have certain conspicuous markings in common, cannot be said to have specific recognition marks. This category includes those species the young of which are very different in color from the adults, a condition that persists for two or three years or more in certain cases. With them must be grouped also, the dichromatic Screech Owl, the four species of Buteonidæ, and the three Jaegers that have a normal melanistic phase, and the numerous species which exhibit completely or nearly completely distinct sexual coloration, either at certain seasons or permanently. We may well enquire therefore how such species as these have made a success of the struggle for existence without the aid of the highly esteemed recognition marks?

If recognition marks are of vital importance why are they so variable?

They vary extremely in the Mniotiltidae, as the writer knows from a special study of the subject. White blotches may be present on anywhere from two to five pairs of rectrices in the same species. The white wing spot so characteristic of *Dendroica caerulescens* varies greatly, and is sometimes absent. Both the primary blotch and tail spots may be lacking in the same specimen.

If liable to considerable individual variation, what dependence can be placed in recognition marks as a means of identifying their fellows, by closely similar species, by *Penthestes atricapillus* and *P. carolinensis* for instance, or *Dendroica auduboni* and *D. coronata*, by the Flickers or Dusky Ducks? One of Wallace's illustrations of recognition marks—those of two species of *Scolopax* (*Darwinism*, fig. 22, p. 225)—certainly does not show more difference than do numerous commonly observed individual variations. One of the fallacies into which coloration theories lead is brought out by a comparison of this figure with that on p. 241 (fig. 23) illustrating a case of mimicry. In the latter cut the objects which are supposed to be so similar that one, the mimic, gains protection by the inability of birds to tell the forms apart, are actually much more different than the two sets of directive markings (shown in the former illustration), which are supposed to be so distinct as to enable the species easily to recognize their kind.

The variability of recognition marks brings up another question: what must be their extent in order that they may have directive value? Take for example the white tips on the tail feathers of the robin, which are extremely variable and often absent. In certain warblers we can get a series showing all stages from no tail spots to large blotches on at least two pairs of feathers. Where can the line be drawn?

Recognition marks are claimed to exist in other groups than birds, even in insects, but in certain cases, becoming more numerous in the lower groups, they are termed warning colors. Where is the line drawn that separates these categories, and why?

Is there any evidence that birds use in a directive sense the patches of colors, termed recognition marks?

A valid objection to the theory has been made to the effect that the usefulness or at least the necessity for these marks depends upon the assumption that the animals possessing them are less acute observers than human beings. Humans can readily recognize species by glimpses of outline when no color is seen, or by peculiarities of motion, in the case of flight at least, at such distances that the observation of color is entirely out of the question. There is much good evidence furthermore that the assumption mentioned is unfounded. Anyone who has handled live decoy

ducks and geese, is familiar with the practice of leaving the mates of some of the birds behind to make them call better during the day. He cannot have failed to observe also when coming back to camp in the evening at what a distance these paired birds become aware of each other's presence and give vociferous greetings. Ducks in no matter how large a flock readily pick out their mates. Can creatures possessed of such powers have any vital need for the comparatively coarse distinctions, not of individuals but of their species as a whole, which are termed recognition marks?

The evidence is very confusing from the fact that the powers of observation of these same birds, so keen in the case just described, apparently become so dull in the presence of decoys, that the extermination of species would result, were shooting not closely regulated. Neither the one occurrence nor the other however is evidence of the usefulness of recognition marks. Hence we may well inquire:

Why, if directive markings are so important in guiding birds to flocks of their kind do so many birds among those reputed to have well developed recognition marks, come freely to the crudest forms of decoys?

The writer was initiated into the mysteries of Shore-bird shooting by Mr. J. B. White, a life long hunter on Currituck Sound, N. C. The decoys we used were merely rounded handfuls of water plants (*Potamogeton*, *Najas* and the like) placed on pegs which held them just above the water. Shore-birds of many species decoyed perfectly to these lumps and if not fired at, would linger among them for some time, feeding in a perfectly normal manner.

Wild ducks are tricked too by very primitive decoys. Old battered ones, with no particular colors, or colors that were never seen on fowls of sea or land, with broken bills, or missing heads are familiar sights on many shooting grounds yet they serve the purpose. Iron ducks with no paint, and wooden ducks, of thrice normal size, which have been sculptured with an ax, are used with great effect by the battery shooters of Currituck. The confiding manner in which Ducks will cluster about a lost decoy, or lie among a setting of decoys that is left out but not very frequently shot over, to say the least, shows a disposition on the part of ducks not to insist very strongly on the possession of certain spots or bands of

color in their temporary associates. In some places decoys representing only the rear parts of ducks are used, and these ever-dipping counterfeits which never show a head, nevertheless fill the bill; in other localities the bottom in shallow water is simply turned up in spadefuls, making dark lumps and ducks decoy to these. Mr. White tells me that the best day's shooting at black ducks he ever enjoyed was begun with his shoes as decoys, dead ducks being substituted as they were killed. These things prove that on some occasions at least some of the most typically flocking birds do not pay any attention whatsoever to markings directive or otherwise.

AN APPARENTLY UNRECOGNIZED RACE OF THE RED-SHOULDERED HAWK.

BY LOUIS B. BISHOP, M. D.

Buteo lineatus texanus subsp. nov.

TEXAS RED-SHOULDERED HAWK.

TYPE.— ♀ adult, No. 22355, Coll. of Louis B. Bishop; Corpus Christi, Texas, Nov. 7, 1909; John M. Priour.

SUBSPECIFIC CHARACTERS.— Similar to *Buteo lineatus elegans*, but breast usually more spotted with buffy, the dark shaft lines of chest more conspicuous and the head and back more rufous.

MEASUREMENT OF TYPE.— Wing, 12.98; tail, 8.62; culmen, .90; tarsus, 3.23 inches.

Sixteen adult Red-shouldered Hawks, collected for me at Corpus Christi and Brownsville, Texas, in October and November, 1909, by Mr. Frank B. Armstrong and John M. Priour, closely resemble each other and differ as described above from the only adult *B. l. elegans* I have been able to examine. They are also much larger than this bird — an adult spring male from California — but not above the measurements given for this race.

These Texas birds are much more richly colored below than fall

specimens of *B. l. lineatus* from Connecticut, having the chest and breast uniform bright cinnamon rufous and the abdomen, tibiae and lower tail-coverts bright buff heavily barred with cinnamon rufous. They are larger than *B. l. alleni* from Florida and have the head and neck not grayish but even more rufous than *lineatus*.

Six young birds collected at the same time differ from the description of young *B. l. elegans* by having the pale spaces on the outer webs of the primaries as large as in *B. l. lineatus*. From the latter they differ by having the lower parts, especially the tibiae, more buffy and the dark markings larger—sagittate or cuneiform instead of oval—and numerous even on the tibiae, which are slightly if at all spotted in *B. l. lineatus*. Young *B. l. alleni* is smaller and has less buff in the plumage, and the dark markings below are even heavier than in the Texas race.

GENERAL NOTES.

Holboell's Grebe in Connecticut.—An unusual flight of *Colymbus holboelli* was noticed here during the month of February, 1912. A specimen was picked up alive in a mowing lot, perhaps two miles from the Connecticut river, on the 9th, the ground at the time being covered with snow and the thermometer near the zero point. The bird could not, apparently, arise from the ground. From the 12th to the 15th, inclusive, nine of these grebes were captured alive on the ice in the Connecticut river. Some of them in trying to escape simply moved along the ice in a rapid manner using their feet for power, but making no attempt to fly. Two of them, however, arose from the ice and flew at a height of from eight inches to two feet for a short distance and then dropped down. Between the dates referred to the river was entirely covered with ice, there being, so far as could be seen, no open water where the birds could obtain food.—JNO. H. SAGE, *Portland, Conn.*

The Forked-tailed Gull (*Xema furcatum*).—Recently in looking over some notes taken at sea a number of years ago (1885) and which had been forgotten I came across the following in relation to the Forked-tailed Gull.

In making a passage from Callao, Peru, to Acapulco, Mexico, we passed in sight of Chatham, one of the Galapagos Islands. When three to four hundred miles distant from the island—both when approaching and when

leaving it — I observed gulls with a forked tail. Their line of flight was always in the direction of the islands — in the evening going to and in the morning going away from them. Morning and evening for three days I saw them.

I sat on deck with gun in hand for parts of the three days trying to procure a specimen of these birds. Twice they came near enough to tempt me to risk a shot; but in both instances the distance was too great for success. One of the birds shot at dropped its feet and shook its feathers as if it were hit.

They were so well marked that I do not think I could have been mistaken in my identification — a forked-tail, a black head, the entire under part of the body white, the back of a darker color I could not determine the shade, and with streaks of black and white on the wings.

I desire to direct attention to another peculiarity in which these gulls differed from the square-tailed gulls. They are not littoral in their habits, but go to sea seeking their food like the gannets. In an experience of fifteen years at sea I have rarely seen the square-tailed gulls far from land. Besides the forked-tailed were quite shy, as is shown in my efforts to procure a specimen. It is the habit of the others to hover about vessels quite near.— THOMAS H. STREETS, *Medical Director, U. S. Navy, Retired, Philadelphia, Pa.*

Cory's Shearwater in abundance off Long Island.— On October 2, 1911, I shot two Shearwaters off the coast of East Hampton, Long Island. I took them to be Cory's Shearwater (*Puffinus borealis*) but to make sure I brought them to Mr. W. DeW. Miller, Assistant Curator of Ornithology at the American Museum of Natural History who confirmed my identification. There were any number of them, together with some Greater Shearwaters (*Puffinus gravis*). The difference between the two species was apparent at quite a distance, the commoner bird appearing darker.— WILLIAM TOD HELMUTH, JR., *New York City.*

Black Ducks which became very tame.— Four Black Ducks (*Anas rubripes*) have been spending the winter in one of the coves at Hadlyme, Conn. The cove has been frozen over with ice from 18 to 24 inches thick. At the north shore of the cove are two spring holes which are near the main road in the town and every day these ducks have been seen by a great many people. Late in the afternoon of Feb. 15 I carried to the spot about a peck of cracked corn and spread around on the ice and placed some in the spring holes, the next morning some crows came and started to eat the corn, but the ducks drove them away, they were too much for the crows.

Soon after the grain was placed there, two more ducks arrived, the second day two, the third day fifteen, and finally thirty arrived to feed, they are very tame allowing one to approach very near before taking flight.

This shows how tame our wildest birds will become, if not shot at or molested.— ARTHUR W. BROCKWAY, *Hadlyme, Conn.*

The European Widgeon at Gardner's Island, New York.—At Gardiner's Island, New York, on December 3, 1911, the writer, in company with Mr. Ludlow Griscom and Mr. Stanley Ladow, had the good fortune to see two adult male European Widgeons (*Mareca penelope*). They were in the North Inlet with a great flock of waterfowl numbering approximately 1000 Baldpates, and 300 Redheads, with a sprinkling of Buffle-heads, Golden-eyes, Red-breasted Mergansers, Lesser Scaups and Black Ducks.

The Widgeons were observed from a low hill overlooking the inlet, under unusually favorable conditions of light and position. They were watched through powerful binoculars for many minutes, at a distance of probably not over 150 or 175 feet, and were most satisfactorily identified.—W. DEW. MILLER, *American Museum of Natural History, New York City*.

The Pintail Duck (*Dafila acula*) in Winter near Portland, Maine.—The Pintail, as it occurs in Maine, is one of the less common, and less hardy migrants, of more frequent occurrence in fall than in spring. Although Mr. George A. Boardman, cited it as "rare in winter"¹ he gave a different statement for the History of North American Birds,² and we must regard his first statement as unverified, according to existing literature.

The next definite consideration, perhaps was that of E. A. Samuels, who gave its New England status, as "September 10 to the last week in October."³

Finally⁴ Mr. N. C. Brown showed that it had been known to remain in the vicinity of Portland, Maine, on one occasion until November 7.⁵

In 1893, Capt. Herbert L. Spinney entered in his private journal, on November 25 the capture of one at Small Point, Maine, and in 1895, Mr. Walter H. Rich secured a pair, male and female, which had been shot February 10, at Cow Island, Casco Bay. One was taken November 20, 1901, at Cape Elizabeth, Maine, but was not preserved. A female was shot at Scarborough, December 9, 1911, the skull of which is preserved.

On February 15, 1912, in company with Messrs. I. W. and E. B. Pillsbury—both men of long experience and familiarity with our shore and water birds—I saw a Pintail drake among many Black Ducks near Martain's Point Bridge between Portland and Falmouth. This was at noon of a bright day, and with glasses, the markings, its dark head, and crissum, attenuated tail and slender outlines, its manner of feeding, rendered both its species and its sex unmistakable. On the day previous Mr. E. B. Pillsbury and game warden George Cushman had seen it at the same place, when it

¹ 1862. Proc. Bost. Soc. N. H., LX: p. 129.

² 1884. Water Birds 11: 514.

³ 1870. Birds of New Eng. and Adjacent States, p. 492.

⁴ In his Feathered Game of the Northeast, 1907, p. 314, Mr. W. H. Rich without specifying time, or place, mentions a pair, "shot in some of the severest winter weather." These birds, now in his possession, were taken in this vicinity, and he has most kindly given me the data credited to him, in this article.

⁵ Proc. Portland Soc. N. H. II: pp. 31.

was observed to fly for several hundred yards, with characteristic speed and strength. That it was not a new comer is indicated by the fact that Mr. John Whitney, a man with a gunner's keen knowledge of the Anatinae, had reported some weeks earlier, a Pintail wintering in the vicinity. That the bird was strong of wing, after, evidently, surviving the low temperature, of the previous week, which ranged each night below zero Fahrenheit, indicates that it had remained through choice, rather than necessity, and with the foregoing notes, shows that the Pintail occasionally spends at least a considerable part of the winter as far northeast as Portland, Maine.—ARTHUR H. NORTON, *Portland, Me.*

White-winged Scoter (*Oidemia deglandi*) in Minnesota.—Late in the Autumn of 1905 a local hunter of this city shot an adult male White-winged Scoter on Lake Minnetonka. I examined this duck in the flesh and tried to buy it but the owner preferred to keep it and had it mounted by the late Henry W. Howling of Minneapolis. It was subsequently destroyed by a house cat.

On Nov. 14, 1911, I secured from a local hunter an adult female in perfect plumage, shot on Lake Minnewashta some two miles distant from this village. This was the only one seen and was not near any other species of duck. Cold weather with snow-storms had prevailed for three days prior to its capture. It was fat and in good condition.—ALBERT LANO, *Excelsior, Minn.*

The Bittern (*Botaurus lentiginosus*) Wintering in New Jersey.—On January 21, 1912, an adult Bittern was brought to me alive by my nephew, Robert W. Moore. It had been caught by him the day previous while he was skating at Walker's Pond about a mile and a half southeast of Haddonfield, N. J. For several days the bird had been noted about the pond in a weakened condition. No wounds were discoverable, but its stomach was empty and, I have no doubt, it was weak from lack of food. Two days after it was captured it died in captivity and was mounted.

Since the 5th of January snow had covered the ground and the extraordinary continuance of the freezing weather from that date to the 20th must have made the securing of its chosen food impossible. Possibly the unusual period of warm weather, which lasted throughout the early winter to January 5, tempted this bird, as well as many other species which usually go south, to winter with us. The latest previous record for the state seems to have been November 19, 1878, at a point much farther south in Cape May Co., and the earliest spring record March 30, so that this instance may fairly be termed the first recorded case of this species wintering in the state.—ROBERT THOMAS MOORE, *Haddonfield, N. J.*

Recent Occurrence of the Egret (*Herodias egretta*) near Portland, Maine.—Although a few authentic records have been made of the occurrence in Maine of the Egret (*Herodias egretta*), the increasing scarcity of

the species in its usual haunts renders especially interesting the recent capture of a beautiful adult example near Portland. This, a female in full nuptial plumage, was shot not far from Black Rock, Scarborough, on April 23, 1911, and was brought to me in the flesh. It is now included in my collection.— HENRY H. BROCK, *Portland, Maine*.

The Snowy Egret in New Mexico.— The writer has to record another occurrence of this species (*Egretta c. candissima*) in a locality near to the one of his previous record ('The Auk,' January 1909, p. 76).

On October 23, 1911, the writer examined, at the ranch of Mr. Montoya (which is at the junction of the East Fork of the Gila River, and Diamond Creek, N. Mex.) a skin of this species taken from an adult bird shot by Mr. Montoya's son near the confluence of Black Canyon, and the East Fork of the Gila River, N. Mex., in April, 1910. The bird had been shot with a rifle, and in the skinning, was so damaged, that its plume characteristics were not available for sex determination. The present record makes the third specimen of this beautiful little Egret taken within a circle whose diameter is less than one hundred miles, the two other records being the one mentioned above, and one by Maj. E. L. Munson, U. S. A., in 'The Auk' of April, 1907, p. 212.— W. H. BERGTOLD, *Denver, Colo.*

King Rail (*Rallus elegans*) at Springfield, Mass.— On the thirtieth day of August, 1911, a King Rail was captured in the wild rice that is found in abundance along the shores of the Connecticut river a few miles below Springfield. There are but two previous records of the occurrence of this bird in the Connecticut valley near Springfield.— ROBERT O. MORRIS, *Springfield, Mass.*

Yellow Rail (*Coturnicops noveboracensis*) in Massachusetts.— During the fall of 1911, three specimens of the above Rail, which is generally supposed to be rare in this state, were brought to my attention. Curiously enough two of these were shot at the same place though at very different dates. The first one was shot on October 3 at West Roxbury by Mr. W. P. Henderson. The second was taken at Chatham on October 2 by Mr. John J. Chickering. The third was shot on the very late date of November 25 also at Chatham by Mr. Russell Bearse. This latter specimen was larger and darker than the others and the yellow on the breast was not so bright. I saw all of these birds at the store of Mr. C. Emerson Brown, the Boston taxidermist, where I carefully examined them.— S. PRESCOTT FAY, *Boston, Mass.*

Yellow Rail in Michigan. A Correction.— In 'The Auk' for January, 1912, p. 101, in my notes on the Yellow Rail, *Coturnicops noveboracensis*, appears the following: "This is the second recorded Michigan specimen and the third noted in Wayne County." This is, of course, a

pen slip on my part for what I intended to state was that "This is the second recorded specimen and the third noted in Wayne County," as there are a number of Michigan records for the Yellow Rail in various parts of the state.—B. H. SWALES, *Grosse Isle, Mich.*

An Albino Semipalmated Sandpiper.—In view of modern inquiry into the significance of abnormal color phases among animals, it may be of interest to record a totally albino specimen of *Ereunetes pusillus*. The specimen, No. 10466, Museums of the Brooklyn Institute of Arts and Sciences, sex undetermined, age apparently adult, was purchased at auction from the estate of the late J. J. Crooke, Esq., of Great Kills, Staten Island, N. Y. Superficially it is entirely white save where the plumage is fat-stained, but the feathers are uniformly dark at their bases. The inscription on the label reads,— "(?) Shot on the shore of Long Is., Oct. 20, '62, out of a flock of sanderlings (*T. arenaria*). Resembles a *T. pusilla* in everything but color." — ROBERT CUSHMAN MURPHY, *Museum of the Brooklyn Institute*.

Last Record of the Piping Plover (*Egialitis meloda*) in New Jersey.—The statement in Stone's Birds of New Jersey that the last record of this species in New Jersey was a bird, observed by Mr. Wm. L. Baily, August 18, 1897, recalled to my mind the collection of a male in the late "nineties." Examining my collection I found the specimen with a tag attached, stating that it was taken at Ocean City, N. J., August 3, 1899. Apparently, then, this is the last recorded bird collected in the state. It was shot out of a small flock of Least Sandpipers, which had settled on the beach to feed. I remember my surprise at finding it among the other victims of my shot and I believe it was the only bird of this species in the flock.—ROBERT THOMAS MOORE, *Haddonfield, N. J.*

Columbian Sharp-tailed Grouse in Wisconsin.—A new record for the state is the capture of a specimen of *Pediacetes phasianellus columbianus* by Mr. A. J. Schoenebeck in Oconto County.—In his list of the birds of this county dated October 27, 1902, he says "On October 25, 1897, I shot an old male of this species near the Peshtigo Brook."—He also records *Pediacetes phasianellis campestris* as "Resident: common. I found several nests of this bird on the plains in the northwest part of this county. Begins laying the last part of May."—The above is to correct a misprint in my "Notes on Some Rare or New Birds to Wisconsin on page 275-276, 'The Auk,' Vol. XXVIII, April, 1911.—HENRY K. COALE, *Highland Park, Illinois*.

Nesting of the Passenger Pigeon (*Ectopistes migratorius*) in New York.—On May 17-19, 1878 I was camped on the west bank of Moose River, Herkimer County, N. Y., near the confluence of the South Branch. The heavy spruce and hemlock had been recently cut out but the hardwoods and much of the smaller growth of conifers remained.

We occupied an abandoned woodchoppers' camp, a quarter mile back from the river and probably two miles from the old road leading from Moose River Tannery to Old Forge. On the 17th several Wild Pigeons were seen frequenting a clump of spruces, averaging perhaps 60 feet high. As now recalled there were probably eight or ten birds seen and in passing from our camp to the river we saw them several times in the same vicinity and finally a few nests were noticed in these spruces. If I remember correctly there were two nests in one tree and two others seen in different trees. On the 17th we thought none of them contained eggs although we did not climb to examine. On the 18th a single egg was taken, perfectly fresh, and we thought it had been deposited that morning, the bird being seen to leave the nest. The nest was on a horizontal limb of the spruce about 30 feet from the ground and 8 to 10 feet out from main trunk, a frail loosely constructed collection of small twigs saddled on the limb and kept together by the small branches of the growing tree.

While this is rather ancient history it may be of interest now that the species appears to be extinct and details of its nesting are not abundant.—C. J. PENNOCK, *Kennett Square, Pa.*

Mississippi and Swallow-tailed Kites in Knox Co., Ind.—On Sept. 18, 1911, I observed a Mississippi Kite (*Ictinia mississippiensis*). It was flying at a moderately low altitude over some cleared bottom land near Benn's Creek, Knox Co. I could distinguish the different shades and stripes of color very distinctly. These beautiful Kites have become quite rare. Formerly they were more common and it is claimed that they nested here.

In the year 1890, in August I also observed two Swallow-tailed Kites (*Elanoides forficatus*) in about the same location. One of these birds was afterwards killed, mounted and placed on exhibition at J. M. Freeman's drugstore, at Bicknell. They also nested here in early days, but are becoming quite rare.—E. J. CHANSLER, *Bicknell, Knox Co., Ind.*

Gray Gyrfalcon (*Falco rusticolus rusticolus*) in Minnesota.—On Dec. 11, 1894, a farmer living near Madison, Lac Qui Parle Co., brought to me a magnificent specimen of this rare species, which he shot near his home. It is a female and in perfect plumage. Its stomach contained the remains of the Prairie Hen (*Tympanuchus americanus*). Its weight was 3 lbs. 10 oz. Its measurements are as follows—L. 24, Ex. 50, W. 16, T. 9.15 in.—ALBERT LANO, *Excelsior, Minn.*

Early Occurrence of the Saw-whet Owl.—Believing that I have one of the earliest records of the Saw-whet Owl (*Cryptoglaux a. acadica*) for Long Island, I should like to record it.

On October 26, 1911, I was told that a "young owl" was killed on one of the streets of Elmhurst, Long Island. I looked it up and found it was a Saw-whet Owl. I secured it and it is now in the collection of the American Museum of Natural History.—HOWARTH S. BOYLE.

Diurnal Activities of the Great Horned Owl (*Bubo virginianus virginianus*).—The observations here given were made from or near my home, which has a prairie location a mile and a half from the woods, that form the western boundary of the timber belt along the Mississippi River. There are many farm clearings near the river, but the western edge of the forest remains uncleared, and in its original untamed condition throughout a strip varying from a mile to three miles in width. In it various solitude-loving species, such as the Red-tailed Hawk, Northern Pileated Woodpecker, and Great Horned Owl still flourish. To reach my neighborhood the last named species must cross a treeless area two miles wide, unless sometimes it hides in evergreen trees that have been planted in yards. During the past winter these owls have been observed much more frequently than in previous seasons; sometimes in the night, but more often by day—in the morning, at noon, in the afternoon, and in the early evening. In the woods in spring and summer it is not an uncommon experience to meet them abroad in the daytime. A neighbor informs me that early in February he saw five of these great birds sitting at the same time in a large water-elm, that is growing on the Mississippi River bottom lands.

At 1.30 o'clock in the afternoon of November 8, 1911, a Great Horned Owl was discovered sitting on the ground in our front yard, where it remained an hour before put to flight by the cat. It sat in an open space, thirty-five feet from the house, and about that distance from the trunks of three evergreen trees. While there it disgorged a pellet, and it safeguarded its position by many watchful turnings of the head.

Just after sunset on December 3 I was halted in the middle of the road by the approach of one of these owls. Flying a little above the telephone wires it crossed the road about fifty yards ahead of me; wheeling it flew back over the road, turned, and again recrossed it, evidently hunting for rabbits that might be skulking beside the fences. Again another rabbit hunt of the Great Horned Owl was watched for a half hour on January 20. It was first seen at three o'clock in the afternoon flying over a field whose covering of unsullied snow in the bright sunlight presented such a dazzling surface as might blind the strongest eyesight. It seemed a test of this species' power of vision that may well compare with the instance cited by Dr. Coues in which these owls watched two white cranes circling high in the air in the direct rays of the sun. Except for a few minutes when on two or three occasions the owl alighted on the snow it was in the air, beating back and forth over an area a little more than an eighth of a mile in length and a trifle less than that distance in width, having on its eastern border a fence and a short row of willow trees. The bird sometimes rose to a height of seventy-five feet, but maintained an altitude of forty feet or less the greater portion of the time. A half mile west of this locality that morning two school-boys saw two of these owls together, and a few days later three of them were seen flying about a solitary willow.

In this vicinity the only apparent check upon the Great Horned Owl

seems to come by way of the steel-trap, when the species becomes too familiar in the farmers' poultry yards. When skins are desired a good method of killing the trapped owls employed by two young farmers is that of smothering the birds in the oat-bin.—ALTHEA R. SHERMAN, *National, Iowa*.

Status of the Picidae in the Lower Rio Grande Valley.—Personally, I have, to the date of writing, found five forms of Woodpecker in the Lower Rio Grande Valley, within the limits of Cameron county, they are:

1. *Dryobates scalaris symplectus*. Abundant resident.
2. *Sphyrapicus varius varius*. Common migrant and occasional winter sojourner.
3. *Centurus aurifrons*. Abundant resident.
4. *Colaptes auratus luteus*. Fall and winter vjsitant.
5. *Colaptes cafer collaris*. One record, ♂ Jan. 8, 1912, collected by myself, and now in collection of Dr. J. Dwight, Jr.

Possibly *Melanerpes erythrocephalus* occurs as a winter straggler, though I have not yet found it.

Indications point to the presence of another Woodpecker, as yet unrecorded by ornithologists. It is known to a number of the native Mexican hunters, who designate it as "carpentera grande"; and describe it as much over a foot in length; black, with scarlet crest: generally occurring during the warm season, and confined to the heaviest growth bordering the river. Totally absent some years. The season of occurrence would at once eliminate the possibility of it being *Asyndesmus lewisi*; and the only other Woodpecker that seems to fit, even in fair degree, the description and conditions is *Phlæolomus scapularis*. This Mexican species ranges well up into the state of Tamaulipas, so it might furnish us stragglers now and then, as in the case with *Amizilis tzacail*, *Ceryle torquata*, *Trogon ambiguus*, etc.—AUSTIN PAUL SMITH, *Brownsville, Texas*.

Differences due to Sex in the Black Swift.—In the treatment accorded *Nephæcetes niger borealis* by Ridgway in the volume last published of his "Birds of North and Middle America" (vol. 5, 1911, pp. 703, 707), the sexes are declared to be different in markings, the adult male uniformly sooty underneath, the adult female with the feathers of the posterior underparts always more or less distinctly tipped with whitish. A different conclusion had been arrived at by Mr. Frank M. Drew (Bull. Nutt. Orn. Club, VII, 1882, 182, 183), who declared that the fully mature female was indistinguishable in color from the male, four years being assumed to be the length of time required to attain this plumage. Mr. Ridgway cites Drew's plumage description in full, with the following comment: "Mr. Drew is undoubtedly mistaken, however, in assuming that the sexes are alike in coloration, for all the sexed specimens examined by me from whatever locality, show that all those with white-tipped feathers on posterior underparts are females and all those without these white-tipped feathers

are males. This is true of all the subspecies, except that in the West Indian forms these white tips are much less distinct, sometimes nearly obsolete" (p. 707, footnote b).

In a series of Black Swifts collected by myself in southeastern Alaska in June and July, 1909 (see Swarth, Univ. Calif. Publ. Zool., 5, 1911, 71) there is one female (no. 9363 Univ. Calif. Mus. Vert. Zool.) that in color and markings is absolutely indistinguishable from the males. The underparts are uniformly dark (except for one pure white feather on the throat), of exactly the same sooty hue as the males, and with not the slightest trace of the scale-like white markings on the abdomen, which Mr. Ridgway believes to be invariably present in the female. Like the others, however, it differs from the males in having a square, rather than a forked tail. The birds collected by me were all carefully dissected to ascertain the sex, and the possibility of there having been a mistake made in this specimen, is precluded by the fact that this particular female contained within it an egg that would have been laid, probably within twenty-four hours. There is no doubt, therefore, that in this case we have a female indistinguishable in coloration from the male, so that sometimes, at least, the sexes are alike in coloration, as Mr. Drew affirmed.

It is with some reluctance that the above statements are offered. The writer is unwilling to appear to be hypercritical of a work so comprehensive, and so admirably carried out, that it should be spared carping comment on immaterial points, and these remarks should not be taken in that sense. They are merely the contribution of an additional fact that may modify previous conceptions of this particular species.—H. S. SWARTH, *Museum of Vertebrate Zoölogy, University of California, Berkeley, California.*

A Crested Flycatcher in December at Cambridge, Mass.—On December 20, 1911, in the Fresh Pond Reservation, Cambridge, I saw a Crested Flycatcher (*Myiarchus crinitus*). It was at midday in the warm sunshine. The bird was among shrub growth planted on a bank of some extent on the northwestern border of the reservation. As I followed along at the foot of the ridge, my attention was quickened by hearing call-notes which could not be ascribed to any bird that might be expected to be heard at this season. When shortly my glasses covered it, it was immediately recognized to be a Crested Flycatcher. The pale reddish wing and sulphur-yellow side were plainly presented to view, also the pale margining of the wing-coverts. Later the pearl-gray breast was seen and the sulphur-yellow of the entire under parts. The bird took short flights from one shrub to another and frequently dropped to the ground for an instant, at once returning to a near perch. Apparently it was procuring its food from the ground, perhaps discerning and obtaining the bodies of dead insects. The ground was bare and had been so up to this time. No perch taken was more than two or three feet high, and usually they were only a few inches above the ground. I followed the flycatcher along the shrubbery for five hundred feet or more, while it was thus engaged and remained with it for

half an hour, often viewing it at a distance of not more than fifty feet. The temperature of the early morning had been 22°. The noon day temperature in the shade was officially given as 39°. The air at the time, however, was soft and warm and calm. Of course there was no insect life in the air, and the bird plainly was not looking for it there. In the afternoon of the following day an hour was spent searching for the bird, but I could not find it.

The Crested Flycatcher is a rare summer resident of Eastern Massachusetts, being so characterized by Mr. William Brewster in his "Birds of the Cambridge Region" and by Dr. C. W. Townsend in his "Birds of Essex County." The latest record for a bird of the species is given by Mr. Brewster as September 26, in 1897, when one was seen in Arlington by Dr. Walter Faxon. Messrs. Howe and Allen in their "Birds of Massachusetts" give the limit of the season as September 12 and a record without specific data of October 15. Mr. Richard M. Marble has a record of one seen by him on October 2, 1910, in the Allendale woods, West Roxbury.

This Cambridge bird, therefore, so far as I am able to determine from records at hand, furnishes the only occurrence of the species later than October 15 and was present sixty-six days after that date. The same means which had afforded it subsistence in October and November were doubtless present in December up to the day it was observed. No snow had as yet fallen to cover the ground. The mean temperature of December was officially given as 6° above the normal and the highest for twenty years. The temperature rose above freezing on all except four days. Thus this flycatcher had had unusually mild weather conditions under which to extend its remarkable stay.

Messrs. Baird, Brewer, and Ridgway in their "History of North American Land Birds, vol. 2, p. 336, state, "During the early summer this species [Great Crested Flycatcher] feeds chiefly upon insects of various kinds; . . . afterwards, as if from choice, it chiefly eats ripe berries of various kinds of shrubs and plants, among which those of the poke-weed and the huckleberry are most noticeable." Many of the shrubs among which the bird moved on the day it was observed were berry-laden.—HORACE W. WRIGHT, *Boston, Mass.*

The Starling (*Sturnus vulgaris*) at Springfield, Mass.—In the spring of 1908 the presence of a single Starling was first noticed in this vicinity. Since that time the number observed in this part of the Connecticut valley has rapidly increased until this winter flocks containing upwards of one hundred individuals have been often seen. They now occasionally come into the very center of the city, frequenting the spires and cupolas of the churches and public buildings.—ROBERT O. MORRIS, *Springfield, Mass.*

Starling (*Sturnus vulgaris*) in Chester Co., Pa.—While the Starling has long been a common resident in the vicinity of New York and adjacent

territory very few have hitherto been reported from Chester Co., Pa., and they only very recently I believe. My first observation of them was made within six miles of West Chester, east of the town Nov. 30, 1911, when two of them were noticed in a field, on the ground. Three days later, on Dec. 3, I observed quite a large flock of them closely associated with a belated colony of Purple Grackles, they were seeking shelter for the night in a clump of evergreen trees on a lawn in the town and numbered thirty or forty individuals, enough to start a good sized colony next spring if they remain.—THOMAS H. JACKSON, *West Chester, Pa.*

Strange actions of a Red-eyed Cowbird.—I have always considered the Cowbirds as playing the character of sneak, when necessity compelled them to seek out the nest of their feathered kin, but in view of the following incident I feel somewhat dubious.

Toward the end of May, 1911, a pair of Sennett's Oriole (*Icterus cucullatus sennetti*) built their semi-pensile nest, composed almost entirely of fibers from stem or leaf of Spanish Dagger,¹ Palmetto² and Banana, in or rather attached to a vine-stalk of a Rosa de Montana,³ that shaded the library windows of our house from the morning sun. Therefore, the position of the nest allowed easy observation at all times. Early one morning, after the complement of three eggs had been laid, and were being brooded, a female Red-eyed Cowbird (*Tangavius æneus involucratus*) was noted on the ground near the site of the nest. Its restless manner held my attention, and within a very few moments the cause was apparent. Walking to the base of the vine-stalk supporting the nest it flew upward several feet then grasping the stalk continued its vertical progress, at the same time flapping the wings vigorously, thereby producing considerable noise. Reaching a point well within a foot of the nest—or about six feet above ground—it arrested progress, but continued the wing movement. Although this needs have perturbed the setting Oriole, she never once quitted her treasures. After a period of a minute or thereabouts the Cowbird flew away. Two days later the same scene was repeated, only, on this occasion, the departure of the Cowbird was due to the appearance of the male Oriole on the scene. The nest was examined at various times thereafter and it never held more than the rightful contents. Two eggs eventually hatched, but the young never left the nest alive, being destroyed by some mammal, possibly the Texas Opossum (*Didelphis marsupialis texensis*) a serious enemy to bird-life in southern Texas.—AUSTIN PAUL SMITH, *Brownsville, Texas.*

The Baltimore Oriole (*Icterus galbula*) Wintering in New Jersey.—An immature male of this species was found dead and frozen stiff in Haddonfield, N. J., January 16, 1912, and brought to me by my nephew, Henry

¹ *Yucca treculeana*.

² *Inodes texana*.

³ *Antigonon leptopus*.

D. Sherrerd. The bird seems to have passed its second autumn, having attained the black throat of the adult, but only a clouded suffusion of orange on the breast and rump. This is the first winter record of the species for New Jersey. I have to thank Mr. Witmer Stone for identifying the specimen and the Division of Birds, United States National Museum for corroborating that identification and supplying additional information. During the preparation of the skin no wounds were discovered, but the stomach proved empty and the body's supply of fat absolutely exhausted. The upper mandible is almost broken through near the tip and the plumage of the under parts very dark, as if stained by contact with the earth. However, snow had covered the ground for twelve days and was accompanied by constant cold weather. Although the bird may have been in a starved condition previous to the 5th, when the first snow arrived, I am sure it did not die until about the time it was found, for several snowstorms occurred between the 5th and the 16th and these would have covered the body up, which on the contrary was found on top of the snow. It is likely that the mild early winter lured the bird to stay with us, that the accident to the bill rendered the procuring of food difficult, and that the sudden and bitter cold of the 5th and subsequent days completed the work starvation had begun.—ROBERT THOMAS MOORE, *Haddonfield, N. J.*

Many Purple Finches at Portland, Maine, in February.—The mountain ash trees in the Western Promenade section of Portland attracted no Robins,¹ under my observation, during the very cold winter of 1911–1912; but they nourished an extraordinary number of Purple Finches (*Carpodacus purpureus purpureus*) in the month of February. On Feb. 2 I saw four birds together, at least one of them being in rosy plumage. On Feb. 28, about 9.30 A. M., I counted fourteen birds in one tree, most of which were in rosy plumage. On Feb. 29, about 2.30 P. M., I counted fifty-five birds in and about seven mountain ash trees, twenty-two of them being at one tree and a majority of the total number, apparently, in rosy plumage. On each one of these occasions all the birds were sluggish and rather silent.

Since the first announcement,² of the wintering of this species at Portland, twenty-four years ago, it has been seen by several observers, and there are winter records which need not here be cited, for other localities in Maine; but I believe it has not hitherto been noted except in small numbers.—NATHAN CLIFFORD BROWN, *Portland, Me.*

Crossbills (*Loxia curvirostra minor*) in Chester Co., Pa., in Summer.—I spent June 16–17, 1911, in company with John D. Carter of Lansdowne, Pa., on and near the Pine barrens of a serpentine ridge in the extreme southwest corner of Chester County, Pa., bordering on the Maryland line. In

¹ Auk, XXVIII, pp. 270–272.

² John Clifford Brown, Auk, V, p. 209.

the scattered growth of Pitch Pine (*Pinus rigida*) which covers the barrens and reaches a height of from fifteen to twenty-five feet we found a group of four Crossbills (*Loxia curvirostra minor*) which we watched for ten minutes or more. They appeared to be two adults and two young in juvenal plumage. One certainly was and we assumed that the other was also; it kept up a continual calling as if to bring the old birds but we did not notice them feed it.

They were gleaning on the new growth of the pines, quite indifferent to our near approach, and seemed to be eating the pinkish terminal buds, frequently cutting them off entirely or in part. We readily approached within thirty feet of them.—CHARLES J. PENNOCK, *Kennett Square, Pa.*

Lapland Longspur (*Calcarius lapponicus lapponicus*) in Delaware.—The occurrence of this species on the Atlantic coast plain more frequently than had formerly been supposed, was suggested by Mr. R. F. Miller, in Cassinia for 1906, p. 63, and the same conclusion was presented to me when these birds were found last winter near Delaware City, Del., as noted in 'The Auk' for January, 1911, p. 114, a subsequent trip to the same marshes, on December 19, 1910, resulted in finding a number of Longspurs and five specimens were secured.

On November 9, 1911, an examination of the same ground discovered Shore Larks (*Otocoris a. alpestris*) fairly abundant; this being the species with which the Longspurs had been found associated the previous winter, but no Longspurs were recognized. On February 1, 1912, with snow and ice covering most of the same marsh, I made a lengthy search for Longspurs. Flocks of Shore Larks were found and followed for several hours. They were in bunches of 4, 8, 12 and 25. In the earlier part of the day the ice and snow-crust were brittle, walking was noisy and the birds not easily approached at close quarters, but by afternoon the sun shone out, the noise was lessened and the birds were getting more food and showed less wariness. The smaller flocks contained no Longspurs. A lone bird that was flushed and gave a two-note rather soft, sweet call and flew high and wild, was thought to be a Longspur, but not until the largest flock was closely followed for an hour or more and carefully examined repeatedly, did I suspect it contained other than Shore Larks. Finally one bird apparently smaller was seen to fly off with the flock and later when they were flushed, on a near approach, the single remaining bird was shot and proved to be a Longspur, adult female. While I think there were few if any other Longspurs with these Shore Larks, the fact of again finding even one of the rarer species in the locality would perhaps indicate their rather regular occurrence.

On bare ground it was impossible to distinguish the two species at a distance of twenty-five yards. On the snow or as they arose singly the distinguishing marks of the Shore Larks could be recognized but when the alarm was given and several or all arose together it was not possible to determine definitely the presence of Longspurs among a large number of Shore Larks.

These notes would seem to suggest that a close scrutiny of the larger flocks of Shore Larks would show a more frequent visitation of the Longspurs than is generally supposed.—C. J. PENNOCK, *Kennett Square, Pa.*

White-throated Sparrow in Idaho.—On November 2 last, a pet cat brought in a fine specimen of White-throated Sparrow (*Zonotrichia albicollis*) which, on skinning, proved to be an immature male. The bird was in good plumage, the white throat and yellow spot before the eyes making its identification absolute, and fortunately the skin was practically undamaged.

So far as I can learn, this is the first record of the White-throated Sparrow in Idaho.—L. E. WYMAN, *Nampa, Idaho.*

Painted Bunting (*Passerina ciris*) in Minnesota.—On May 2, 1893, I shot an adult female near Madison, Lac Qui Parle Co., in the southwestern part of the state. The skin remained unidentified in my collection until September, 1910, when it was sent to the Biological Survey at Washington where it was examined by Mr. Harry C. Oberholser.—ALBERT LANO, *Excelsior, Minn.*

Lawrence's Warbler (*Vermivora lawrencei*) in Chester County, Pa.—The Serpentine barrens of the southern part of Chester County, Pa., are interesting on account of the presence of Prairie Warblers (*Dendroica discolor*) among the scattered pine growth, this being apparently the only spot in the county where this species breeds. On June 16, 1911, John D. Carter and myself found them quite abundant and about two miles beyond the barrens in deciduous woods not more than 250 feet above sea level we were surprised to find a Chestnut-sided Warbler (*D. pensylvanica*) busily engaged in searching for food.

Next day about three miles west of the barrens and close to Octoraro Creek on a steep hilltop 300 feet elevation we had a clear and continued view of a Lawrence's Warbler (*Vermivora lawrencei*). There was a clearing grown up to deciduous new growth, twenty to thirty feet high. As we entered by a wood road the bird flew up into a large solitary tree by the roadway and we had a clear view of it at a distance of about thirty feet. It remained on the same perch at least three minutes, and sang four or five times—two single high-pitched fine spun inspirations and then three or four shorter notes rapidly uttered to give a trill effect "Tse-e-e-e", Tse-e-e-e, Tse Tse Tse Tse." The markings of the head were identical with those of an adult male *V. chrysoptera*, the body and wing markings those of *V. pinus*, the combination appearing quite different from the figure in Chapman's "Warblers of North America" but identical with the plate in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1874.—CHARLES J. PENNOCK, *Kennett Square, Pa.*

A Palm Warbler in winter at Boston, Mass.—In the Arnold Arboretum at Jamaica Plain a Palm Warbler (*Dendroica palmarum pal-*

marum) was seen by me on December 14, 1911, and was observed by myself and others upon various days to the end of the month. Mrs. A. M. C. Levey informs me that it was still present on January 3, 1912. The bird remained about the museum building and was always observed in close proximity to it. Sometimes it was seen upon the grass plots in front of the museum and even upon the door-steps, quite as familiarly disposed as a Chipping Sparrow. When under observation it kept much of the time on the ground, as is not unusual with birds of the species, evidently obtaining its food there. Its haunt was backed by a thick growth of young conifers standing upon a bank having a southeastern exposure, in front of which are shrubs of various kinds and crab-apple trees, and at the border a shallow stream flows to the meadow. The warbler was usually feeding around and under these shrubs and crabs, silently, but occasionally giving its characteristic call-note. It was, when first seen, in association with a little company of four White-throated Sparrows (*Zonotrichia albicollis*), but later was usually alone and unaccompanied. In plumage it was a good type of the species, having a dingy white breast and bright yellow under tail-coverts, with obscurely streaked sides. It constantly wagged its tail.

The Palm Warbler is a rare autumn migrant in this section and has seldom been seen after the middle of October. Mr. William Brewster records one seen by him in Cambridge on October 28, 1895. Mrs. Edmund Bridge informs me that two were present on her home grounds in West Medford on November 19, 1911. Mr. Ralph Hoffmann has a published record of one seen in Cambridge on December 6, 1902 (Brewster's "Birds of the Cambridge Region").

As regards the food which has been obtained by this warbler, it is of interest to quote the testimony of Mr. B. S. Bowdish, given in 'The Auk' for January, 1903, p. 19, where he says of the Palm Warbler, "A large number of stomachs examined in Cuba contained seeds." Again, in 'The Auk' for April, 1903, pp. 193 and 195, Mr. Bowdish states, "So far as I have noticed, few writers have given much attention to the extent to which many birds of families which in the States are considered more or less strictly insectivorous, feed in the West Indies largely on fruit and seeds . . . I also found seeds in the stomachs of the Black and White, Parula, Myrtle, Palm, and Prairie Warblers, particularly the Myrtle and Palm, the latter feeding almost exclusively on seeds of weeds near Santiago and Guama, Cuba."

Mr. Harold L. Barrett later informed me that he had observed this warbler in its chosen haunt on November 26, 27, and 29 and on December 4 and 9. So the presence of this bird, based on records, extended from November 26, 1911, to January 3, 1912, thirty-nine days. After this time it could not be found. Snowfalls occurred followed by severe cold weather.

— HORACE W. WRIGHT, *Boston, Mass.*

Hooded Warbler (*Wilsonia citrina*) at the Delaware Water Gap, Pa., in July.—In the rather dense woodland on the northern slope of Mt. Minsi at the Delaware Water Gap, Pa., I saw a beautiful male Hooded Warbler (*Wilsonia citrina*) on July 5, 1909. I was in a great hurry unfortunately and did not have time to investigate. When I passed the bird flew into the lower branches of a tree and called anxiously as though his nest was near.—EDWARD J. F. MARX, *Easton, Pa.*

Mockingbird Notes from Massachusetts.—On October 23, 1911, I took at Nantucket a young Mockingbird, and at the same time I saw the two parent birds. There is no doubt from the condition of the plumage that this bird was bred not far from the spot where it was taken.

Mr. Francis H. Allen recorded in 'The Auk' (Auk, XXVII, 1910, p. 460) a pair which successfully raised a brood of four young near his house in West Roxbury in 1909, one of the parent birds having been seen off and on from November 22, 1908, the other parent bird was first seen early in April, and the birds were last seen August 8. A Mockingbird was seen in the same locality October 7, 1909, to May 14, 1910, November 6, 1910, to April 14, 1911, and again November 5, 1911; this was presumably the same bird.

Mr. Horace W. Wright reports seeing Mockingbirds in the Parkway near the Longwood railway station several times in the winter of 1910 and the spring of 1911; three if not four birds were seen repeatedly. These birds were also seen by Mr. E. E. Caduc and other observers. None of these birds was seen after the middle of April. Dr. Charles W. Townsend reports seeing a Mockingbird at Ipswich August 26 and 28, 1910. Mr. Winthrop S. Brooks saw a pair at Manomet, Plymouth County, on December 14, 1911. One of these, a female, he shot and gave to the Boston Society of Natural History. These records show that the Mockingbird is more common in Massachusetts than is generally supposed.—THOMAS S. BRADLEE, *Boston, Mass.*

A Catbird spending the Winter in Connecticut.—On the morning of January 14, 1912, I was somewhat surprised to see a Catbird (*Dumetella carolinensis*) at Old Lyme, New London County, Connecticut, while walking along one of the main roads in the town and about one mile from the sound shore. The temperatures on the morning of the 13th was from 15° to 20°. I watched him for about ten minutes as he jumped from bush to bush along the roadside.

Also saw on February 14 a Belted Kingfisher (*Ceryle alcyon*) in zero weather when the Connecticut river, ponds, coves, etc. were frozen from fifteen to twenty-four inches thick and no chance for good fishing. A single Kingfisher spent the winter at Hadlyme two years ago, 1910.—ARTHUR W. BROCKWAY, *Hadlyme, Conn.*

Note on *Hapalopteron familiare* (Kittl.).—For many years there have been in the collection of the Philadelphia Academy two specimens of a bird resembling in general style of plumage a faded Kentucky Warbler (*Oporornis formosa*). They formed part of the mounted collection of Dr. T. B. Wilson, and while one was without data of any kind the other bore a tag containing the following which I have only recently been able to decipher, "Is. Arzobispo Port Lloyd Lat. 27.05 36 N. Long. 139 51. 16 E. Samedi 9 Mars. 1850 Yeux noirs."

Recently I accidentally came across the description of *Ixos familiare* Kittlitz in a footnote p. 120, Vol. VI, Brit. Mus. Cat. of Birds and at once recognized that it applied to our birds. Seebohm in the Ibis, 1890, p. 100, refers to the rediscovery of the species by Mr. Holst in 1889 and Blackiston and Pryer mention two live specimens in the Tokio Museum (Trans. As. Soc. Japan, 1882, p. 138), but I can find no other records of the bird, and our specimens therefore have considerable historical interest being apparently the first ones obtained after the original discovery of the species.—WITMER STONE, *Academy of Natural Sciences, Philadelphia.*

Hermit Thrush Wintering at Easton, Pa.—On January 1, 1908, I had the great pleasure of seeing a Hermit Thrush (*Hylocichla guttata pallasi*) in a woodland on the outskirts of Easton, Pa. Realizing that this was an unseasonable date for this species, I took great care in establishing its identity. Its peculiar habit of raising and lowering the tail with an accompanying flap of the wings together with the characteristic coloring of the upper parts—tail a brighter brown than the head—named it conclusively. Through January and February the bird was seen seven times, the last time being on February 29, so I had ample time to observe it. During these two months it remained in the same piece of woodland and some second-growth adjoining. The bird endured vigorous weather, for the thermometer several times fell almost to zero. The Thrush showed a great fondness for the berries of the hackberry (*Celtis occidentalis*) and spent much of its time feeding in one of these trees.

Four years later, on January 1, 1912, I saw another Hermit Thrush in a wood near where the one had been seen in 1908. This bird was also closely watched and satisfactorily identified. However, I did not see it again although I looked for it on several different occasions.—EDWARD J. F. MARX, *Easton, Pa.*

Correction.—On page 107 of the January Auk the size of the Water Fowl Cage in the Lincoln Park Zoo in Chicago is given as "40 × 15 feet," a mistake of the compositor—it being 50 × 150 feet. The idea of 200 wild ducks, geese and other birds being confined in a cage 40 × 15 feet is of course ridiculous.—HENRY K. COALE, *Highland Park, Ill.*

Greenland Wheatear Seen in Massachusetts.—On Sept. 17, 1910, I saw a Wheatear at Pigeon Cove, Mass., at the extreme point of Cape Ann,

and although I did not secure the bird, I had a good opportunity to observe it for sometime, making careful note of the size and coloring of the bird and the characteristic marking of the white upper tail-coverts and white tail feathers, broadly tipped with black.

I flushed the bird four or five times and as it made low flights from me, it spread its tail, which looked short, and the large white spot, on the upper tail-coverts and tail, with broad blackish band at the end of the tail, was particularly conspicuous.

The bird was alone and on some large loose rocks, at the top of the broad expanse of rock, which gradually extends to the ocean, and when flushed could have easily flown to the nearby shrubbery and trees, but in each case flew to another part of the loose rocks. At one time, when I thought the bird had gone, I was surprised to have it dart down from above in an almost perpendicular flight and light on one of the rocks in front of me.

For about a week previous to Sept. 17, there had been a very strong north wind.

The subspecies was necessarily undetermined but undoubtedly was the Greenland Wheatear (*Saxicola oenanthe leucorhoa*).

The above note is offered as of interest, if not conclusive proof of the occurrence of the bird in Massachusetts.—CHAS. R. LAMB, Cambridge, Mass.

Stray Notes from New Brunswick.—*Uria lomvia lomvia*. An adult male in my collection was picked up in the snow at Barton Station on the Keswick River, eighteen miles above Fredericton, on Nov. 26, 1902. The stomach was empty and no doubt the bird, being lost had starved to death.

Cryptoglaux acadica acadica. Fairly common in York County frequenting the dense spruce and cedar forests. At Scotch Lake on April 8, 1902, I found a nest in a deserted woodpecker's excavation in a spruce stub. The nest entrance was about fifteen feet from the ground and ten inches from top of stub. The entire lower half of the hole was filled with feathers and rabbit fur on which the six pure white eggs were layed.

Phloeotomus pileatus abieticola. Fairly common in the spruce forests near Fredericton where they nest. Observed several times along the Tobique during winter of 1903-4.

Passerherbulus nelsoni subvirgatus. Common on the islands in the St. John River above Fredericton especially on Sugar Island where they nest in considerable numbers. An adult male secured on Keswick Island, Aug. 20, is in my collection.

Bombycilla garrula. I well remember the one and only time I ever saw this species in the east. It was a cold raw day, March 10, 1902, that I found a flock of five feeding on the frozen berries of mountain ash in a front yard on Charlotte St., Fredericton. They were very tame and I watched them as they fed, at a distance of not more than twenty feet.

Dendroica tigrina. Common during migration in the spruce forests around Scotch Lake where they can usually be found in early May feeding

in company with other warblers. Only one nesting record for the Province is known to me, namely St. John, 1884.—STANLEY G. JEWETT, *Portland, Oregon.*

Some British Columbia Records.—*Sterna caspia*. CASPIAN TERN.—An adult Caspian Tern was seen about the head of Okanagan lake for some time on July 8, 1910, keeping just out of gun-shot of me. It was in full summer plumage and constitutes the first definite record of the species for British Columbia, though I was practically certain of my identification of one some three years ago at the same locality.

***Micropalama himantopus*.** STILT SANDPIPER.—I saw this Sandpiper again last August for the first time since 1899.

The first were seen on August 8 when I took three which were feeding with some Lesser Yellowlegs; two days later at the same place (Okanagan Commonage) I saw five more and collected four of them. All were young birds in the first plumage with a few feathers of the gray winter dress coming in.

***Ereunetes pusillus*.** SEMIPALMATED SANDPIPER.—I wish once again to put on record that this is a common, or even abundant, migrant in British Columbia from the coast to the Rockies. Here at Okanagan about the center of the Province it outnumbered the Western Sandpiper one hundred to one. During the last fall migration I scrutinized every *Ereunetes* seen, several hundred in all, through a powerful glass, and shot a number of birds I was doubtful of, all were typical *pusillus* and I have only taken three or four Western Sandpipers east of the Cascades in all my collecting.

***Limosa fedoa*.** MARBLED GODWIT.—One seen on August 7, 1910, constitutes the first record I have for Okanagan or for anywhere in the Province east of the coast.

***Dendragapus richardsoni*.** RICHARDSON'S GROUSE.—During the past few years I have shot a number of these grouse in the Selkirk and Rocky Mountains, and have been surprised at the darkness of their coloration, fully as dark as *fuliginosa*.

The shape and coloration of the tail feathers was in every instance the same as in typical *richardsoni*, and an adult male killed in the Rockies had the bare skin on the sides of the neck dull reddish and without any trace of gelatinous thickening, precisely as in all *richardsoni*. Adult males of the Sooty Grouse have the skin on sides of the neck tremendously thickened, of a deep yellow color, and with a velvety texture and wrinkled surface.

As in other Grouse this is inflated when the bird is "hooting." The hooting of the Sooty Grouse can be heard for miles, while that of Richardson's Grouse is usually inaudible at a distance of one hundred yards, though the single hoot, which all Indians say is made by the female bird, has the same volume of sound in both species.

***Xenopicus albolarvatus*.** WHITE-HEADED WOODPECKER.—For twenty

years or more a bird in the Provincial Museum at Victoria has constituted the only record for this species for British Columbia. This is said to have been taken many years ago in Similkameen valley by Mr. R. U. Griffin, but has never had any label to my knowledge.

I am glad to be able to now record the capture of a fine adult female by Mr. James Munro near Okanagan Landing on December 20 last.

Selasphorus alleni. ALLEN'S HUMMINGBIRD.— I wish now to recall my former tentative record of this species in British Columbia. After examining a series of undoubted *alleni* in the Museum of Vertebrate Zoölogy at Berkeley, I have come to the conclusion that I have never seen this species in the Province.

Zonotrichia querula. HARRIS' SPARROW.— An adult taken by myself April 30, and a juvenile taken by Mr. James Munro December 1, both at Okanagan Landing constitute two fresh records for B. C. It is curious that five out of the six records for the Province were made in the winter months.

Ammodramus s. bimaculatus. WESTERN GRASSHOPPER SPARROW.— After a considerable interval during which I have lost sight of this little sparrow I was last year able to re-locate the species in the hills back of Okanagan Landing and took adult and young in first plumage as well as a nest with four eggs. They are rare now in the locality where I first found the species in 1898.

Melospiza c. rufina. SOOTY SONG SPARROW.— Although Okanagan is in the semi-arid belt its Song Sparrows seem to be closest to this subspecies. In my collection I have both breeding birds and others taken in midwinter which cannot be distinguished from specimens taken on Queen Charlotte Islands and at Quatsino Sound (N. W. coast of Vancouver Id.).

The lightest British Columbian skins I have in my series are from Chilliwack, but taken as a whole the Song Sparrows of B. C. are remarkably uniform, and for my part I would be very glad to see the subspecies *morphna* dropped altogether.— ALLAN BROOKS, Okanagan Landing, B. C.

Eastern Oregon Notes.— In 'The Auk' for April, 1911, was published a note extending the range of *Oreortyx*, to all intents, to the Idaho boundary, the exact limit being 15 miles west of the Snake river, at Vale, Oregon.

Since this article appeared further data on this species lead me to think that this partridge is gradually extending its range eastward.

They were found rather common and nesting 15 miles above Vale along Bully Creek, a tributary of the Malheur river, also they were reported rather common at Skull Springs some 50 miles southwest of Vale. A covey of young was seen at Willow Creek a few miles above Ironside at the base of the Burnt River Mts.

Reports of the presence of the species have been received from several of the tributaries of the Malheur River proving that the bird is more or less generally distributed over a considerable extent of the eastern part of the state.

Following a rumor that the "California Quail" had been introduced I made inquiry of several of the settlers but found nothing to confirm such report.

The Partridge seems first to have appeared on Upper Willow Creek about 10 or 12 years ago and gradually became somewhat common. The hard winter of 1905-06, drove many flocks to the barnyards for food, where it would seem they met with almost universal destruction at the hands of settlers.

For several years they were not seen at all, but are again becoming somewhat common. No specimens have been examined, I am therefore unable to state how the species compares with those from the Cascades and Coast Mts.

The past May a small colony of two or three pairs of Bobolinks were found nesting in a meadow at Ironside, the first record I think for the state, and extending the known range of the species considerably to the westward.—A. W. ANTHONY, *Portland, Ore.*

Additions to Birds of Kerrville, Texas.—In my paper on the Birds of Kerrville, published in 'The Auk' 1911, pp. 200-219, I accidentally omitted the following species.

Charitonetta albeola. BUFFLE-HEAD.—Occasional on the Guadalupe river. A female was shot last December in the neighborhood of Kerrville.

Bartramia longicauda. UPLAND PLOVER.—Formerly very numerous during migration in the more open parts of the country, but rapidly becoming scarcer.

Aquila chrysaëtos. GOLDEN EAGLE.—A young bird taken from a nest near the head waters of the Guadalupe, was kept for several years as a pet in a saloon at Kerrville. Have seen the bird two or three times on Turtle Creek. One was shot near the head of the Guadalupe river some time during last winter and the stuffed skin is in Kerrville.

Haliaeetus l. leucocephalus. BALD EAGLE.—Formerly not uncommon and used to breed on bluffs along the Guadalupe, Frio and Medina rivers. Both of these Eagles are occasionally troublesome to the ranch owners, killing young lambs and kids.

Last year I also added two species to my list of birds of the neighborhood of Kerrville.

Pelecanus erythrorhynchos. WHITE PELICAN.—On April 23, a flock of about eighty were seen along the river about three miles from Kerrville, and one of them was killed and I saw the remains.

Wilsonia pusilla pileolata. PILEOLATED WARBLER.—One male at the ranch on Turtle Creek May 11, 1911.—HOWARD LACEY, *Kerrville, Texas.*

Recent Records from the Valley of the Lower Rio Grande.—Two examples of the Yellow-crowned Night Heron (*Nyctanassa violacea*) ♀ Jan.

8, and ♂ Jan. 19, 1912, shot at a point about seven miles up the river from Brownsville, establishes this species as a resident. Of the nine or ten forms of Herons ranging into the Lower Valley, it is the most thinly distributed.

An immature Golden Eagle (*Aquila chrysaëtos*) sex unknown, was shot near San Benito, Tex., 19 miles N. W. from Brownsville, early in January, 1912, by H. N. Prentiss. It was mounted and is now on exhibition at a drugstore in Brownsville, labeled as *Mexican Eagle*. The nearest locality known to me where this species occurs as a resident, is in the mountains, some distance south of Monterey, Mexico, approximately 200 miles distant.

On Jan. 4, 1912, I secured near Brownsville an adult female Long-eared Owl (*Asio wilsonianus*) my first record here.

Several years ago (Nov. 1909), I felt certain I had espied a Green-tailed Towhee (*Oreospiza chlorura*) on the ground in the dense chaparral. Now I feel sure that my identification was correct, for on Jan. 7, 1912, I collected an adult female near Brownsville. It may prove to be a more or less common winter visitant, for it is easy to confound it with the Texas Sparrow (*Arremonops rufivirgatus rufivirgatus*) in life. Its superficial appearance in life, and its habits, closely resemble those of the latter, although the Green-tailed Towhee is a much more confiding bird.

The Western Tanager (*Piranga ludoviciana*) is again wintering in small numbers. I secured an adult male on Dec. 12, 1911, for specific date. Last year it was noted through the winter months up to March. Several examples secured here during winter of 1910-11 are in the collection of Dr. J. Dwight, Jr.—AUSTIN PAUL SMITH, *Brownsville, Texas*.

The Names "Purple Finch," "Mavis," and "Highhole."—In my article on The Current English Names of North American Birds ('The Auk,' Vol. XXVI, Oct. 1909, p. 358) I referred to the name "Purple" as applied to *Carpodacus purpureus* as "a monumental witness of an inability to properly discriminate either between two very different shades of color or in the use of the right word." The species in question appears under this name in Catesby (Nat. Hist. of Carolina, Vol. I, p. 41). From the letter of a correspondent under date of May 1, 1911, I quote the following—"I copied some of your article and had it printed in a Worcester, Mass., paper—The Telegram, using your name and giving you the credit of it. In yesterday's paper a Webster, Mass., bird-lover takes exception to the statement that the Purple Finch is wrongly named as to color, saying that it is the color of Tyrian purple, and evidently meaning that it was named for an ancient or classic color, and not the modern purple. Do you agree to this?"—I certainly do agree to it, and I wrote my correspondent thanking her for the correction. The gorgeous Tyrian purple, a dye obtained from certain gastropod molluscs (*Purpura* and *Murex*), was a symbol of wealth and rank among the early peoples of the eastern Mediterranean. In Murray (The Oxford Dictionary) under the word "purple" there is this definition—"Tyrian purple, which was actually crimson,

in the middle ages applied vaguely to many shades of red, now applied to mixture of red and blue in various proportions, usually containing also some black or white or both, approaching on the one side to crimson and on the other to violet." The Purple Finch was therefore appropriately named though approaching to crimson, while the Purple Grackle and the Purple Martin were equally well named though approaching to violet. My notion of "purple" evidently inclines to the violet.

In this letter my correspondent also says—"I used to hear the Wood Thrush called the 'red Mavis' at Framingham, Mass., where I spent my childhood." This is interesting as indicating a possible transit of the name with some early colonists and its local survival.

In Newton's "Dictionary of Birds" I find the following in a footnote under "Woodpecker"—"The number of English names, ancient and modern, by which these birds are known is very great, and even a bare list of them could not be here given. The Anglo-Saxon was *Higera* or *Higere*, and to this may plausibly be traced 'Hickwall,' nowadays used in some parts of the country, and the older 'Hickway,' corrupted first into 'High-haw,' and, after its original meaning was lost, into 'Hewhole,' which in North America has been still further corrupted into 'Highhole' and more recently into 'High-holder.'"—SPENCER TROTTER, *Swarthmore College, Penn.*

RECENT LITERATURE.

Ridgway's Birds of North and Middle America. Part V.¹—This long delayed volume forming Part V of Mr. Ridgway's great work appeared November 29, 1911, but was not generally distributed until more than a month later. It comprises the remaining Passerine families, Pteroptochidæ (1 species), Formicariidæ (66 species and subspecies), Furnariidæ (29),

¹ The Birds of North and Middle America | a Descriptive Catalogue | of the | Higher Groups, Genera, Species, and Subspecies of Birds | known to occur in North America, from the | Arctic Lands to the Isthmus of Panama | the West Indies and other Islands | of the Caribbean Sea, and the | Galapagos Archipelago | by | Robert Ridgway | Curator, Division of birds.

Part V. | Family Pteroptochidæ — The Tapaculos Family Dendrocolaptidæ — The Woodhewers | Family Formicariidæ — The Antbirds Family Trochilidæ — The Humming Birds | Family Furnariidæ — The Ovenbirds Family Micropodidæ — The Swifts | Family Trogonidæ — The Trogons | — | Washington: | Government Printing Office. | 1911. = Bulletin of the United States National Museum. No. 50. Part V. — 8vo. pp. i-xxiii + 1-859, pls. i-xxxiii.

and Dendrocolaptidae (41) as well as the Trochilidae (174), Micropodidae (25) and Trogonidae (23) of the Coraciiformes.

The style of treatment, details of synonymy and distribution, etc., are fully up to the high standard of the preceding volumes, while the mass of information relating to extralimital species contained in the keys and foot-notes will be as heretofore most welcome to the student of South American birds. While this volume, covering as it does, the exceedingly difficult Tracheophone families and Hummingbirds is perhaps a more valuable contribution to ornithology than any of its predecessors, it contains but few species which range north of the Mexican boundary. In fact only twenty-three of the forms here treated are to be found in the A. O. U. Check-List and unfortunately for those who hoped that stability in nomenclature had been reached in the last edition of that work, Mr. Ridgway has found occasion to alter the names of seven of them. These proposed changes however are all questions of specific or subspecific rank or of the subdivision of genera — largely matters of personal opinion. The genus *Trogon* is subdivided and *T. ambiguus* is placed in *Trogonurus*; *Cypseloides* meets the same fate and our Black Swift appears as *Nephacelles niger borealis*; *Uranomitra* is united with *Amizilis*; *Atthis morcomi* is regarded as a subspecies of *A. heloisa* and *Amizilis chalconota* as a subspecies of *A. yucatanensis* not of *A. cerriniiventris* while the recognition of extralimital subspecies of *A. tzacall* and *Basilinna leucotis* requires the duplication of the specific name in the North American forms in order to conform to the method adopted by the new edition of the Check-List and by Mr. Ridgway.

Most of the new forms described during the progress of the work have been published elsewhere but the following date from the present volume; *Campylorhamphus trochilirostris major* Rdgw. p. 269, *Popelairia conversii saltrini* Zeledon ms. p. 680, *Chrysotrogon ramonianus goeldii* Rdgw. p. 786 and two new genera *Chrysotrogon*, p. 784, and *Mearnsia*, p. 686.

While following the prevalent custom of adopting the original spelling of names Mr. Ridgway now and then finds himself unable to live up to the practice. For instance *guy* is emended to *guys* and *Manikup* is rejected entirely as 'barbarous and cacophonous.' The recent wide-spread discussion as to the proper method of fixing generic types has led the author to leave some cases in abeyance. For instance he adopts *Archilochus* for *Trochilus* of authors but fails to substitute the latter for *Aithurus*; and he adopts the admittedly untenable name *Rhopoterpe* pending the fixing of the type of *Myrmornis*. These are trivial matters but it seems unfortunate that they could not have been settled in a work of such scope and authority.

It is welcome news to learn that good progress has been made with Part VI and we feel sure that ornithologists the world over, while renewing their acknowledgment of indebtedness to Mr. Ridgway, will wish him every facility for the successful completion of the great task that he has undertaken — W. S.

Sclater's Birds of Colorado.¹—This work forms a handsome uncut octavo volume of 576 pages, beautifully printed on heavy unsized paper, illustrated by sixteen excellent halftones from photographs of birds and nests by R. B. Rockwell, E. R. Warren and H. W. Nash; a contour map of Colorado and a frontispiece portrait of General William J. Palmer.

As he explains in the introduction Mr. Slater was induced to prepare this volume by the often expressed desire of General Palmer but before it was ready for publication the General died and the work now appears as a personal tribute to him, the expenses of publication being defrayed by his sister-in-law, Mrs. Wm. L. Slater and his brother-in-law, Mr. Chase Mellen. General Palmer's interest in nature and in the welfare of the Colorado College Museum of which Mr. Slater was for some time director are thus fittingly memorialized.

The introduction contains a few paragraphs on the physical features of Colorado and nominal lists of the birds arranged according to character of occurrence and vertical distribution.

The main text consists of a key to the orders, keys to the families and genera, and keys to the species, diagnoses of the families and genera; and detailed treatment of the species. Under each species are given the A. O. U. number; references to the published Colorado records, the papers being listed in a bibliography at the end of the volume and referred to here by number; a full description; a paragraph on distribution, abundance and time of occurrence; and a short account of habits.

The Aiken collection of Colorado birds secured for the Colorado College Museum by General Palmer forms the basis of Mr. Slater's work while he makes special acknowledgment to Chas. E. Aiken, E. R. Warren and Judge Junius Henderson for assistance and to the extensive notebooks of the late Dennis Gale.

Mr. Slater has apparently made an exhaustive study of the literature of Colorado ornithology and his work is a scholarly compilation. Authorities are quoted frequently for nearly all statements—so frequently indeed that one misses the freshness and life that characterize accounts of bird habits drawn more largely from personal experience, but Mr. Slater makes no claim to original investigations and in the comparatively short period of his residence in Colorado he has certainly admirably mastered the subject which he here presents, the History of the Birds of Colorado.

The nomenclature and classification used are "almost without exception that of the recently published third edition of the A. O. U. Check-List" Whether *Pediocates*, *Archirochilus* (for *Archilochus*) and *Chondestes gram-*

¹ A History of the Birds of Colorado | By | William Lutley Slater | M. A. (Oxon.), M. B. O. U., Hon. M. A. O. U. | (Lately Director of the Colorado College Museum.) | with Seventeen Plates and a Map. | Witherby & Co. | 326 High Holborn London | 1912. American agents Stechert & Co., West 20th St., N. Y. City. Price, \$5.

micus are intentional or accidental deviations we cannot say as they are used without comment.

It would have been better perhaps if the 'distributions' had been quoted more exactly from the A. O. U. list as some of them as they stand are rather misleading, the Western Grebe for instance is said to breed south to central Mexico. Some other remarks are rather startling as the statement that the Thrasher gets its name from "its habit of beating or thrashing the insects it catches until dead and deprived of wings and legs," while the 'double moult' as a character of the Sylviidæ does not seem to apply to any of the Colorado species. By a curious *lapsus* Mr. D. D. Stone is constantly referred to as Mrs. Stone! These however do not detract from the general excellence of Mr. Sclater's volume which certainly provides Colorado ornithologists with an admirable basis for future work.—W. S.

* **Howell's Birds of Arkansas.**¹—There are to-day but few states without adequate bird-lists. One of the most neglected in this respect has been Arkansas, but thanks to Mr. Howell we have now an admirable annotated catalogue of the 255 species and subspecies hitherto taken in the state or reported by competent observers.

The data upon which the report is based were largely collected by the author during a collecting trip in the spring and early summer of 1910, while additional information was gathered by other members and correspondents of the Biological Survey. The dearth of publications on the birds of Arkansas may be realized when we find that the author is able to quote only four titles in his bibliography and that prior to 1902 only 48 species had been reported from the state.

The distribution, time of occurrence and relative abundance of the various species are well discussed by Mr. Howell while the breeding ranges of several species are carefully mapped, those of the Whip-poor-will and Chuck-will's-widow proving to be almost exactly complementary. Several excellent halftone plates from drawings by Fuertes and photographs of characteristic scenery and a faunal map add to the attractiveness of the report.—W. S.

* **Burns on the Broad-winged Hawk.**²—Mr. Burns has brought together in this monograph a vast amount of information. It is based upon "twenty-two years of personal observation and five years of close study of the literature." Those portions which are based upon the author's personal observations form the most valuable part of his work. Mr. Burns has

¹ *Birds of Arkansas.* By Arthur H. Howell, Assistant Biologist, Biological Survey. U. S. Department of Agriculture. Biological Survey Bulletin No. 38. 1911. pp. 1-100.

² *A Monograph of the Broad-winged Hawk, Buteo platypterus,* by Frank L. Burns with the co-operation of over one hundred American Ornithologists and the compilation of the *World's Literature.* Wilson Bulletin, XXIII, Nos. 3-4, Sept.-Dec., 1911, pp. 141-320.

for years made a special study of the Broad-wing and his accounts of its plumages, molt, flight, food, voice, action and disposition, both wild and in captivity, migration, mating, nidification, etc., form a valuable contribution to ornithological literature. The numerous quotations appended from the publications and manuscripts of others are of rather unequal value and trustworthiness.

In the treatment of the literature the desire to include mention of every scrap of published information regardless of its value has led to the accumulation of a mass of detailed data and titles that is bewildering in its extent and could have been reduced into well digested summaries which would have been of far more benefit to the reader. The lengthy bibliography too, gives scarcely a clue to the contents of the papers and fails to distinguish important titles from those containing mere casual mention of the subject of the monograph. A shorter list of the really valuable papers with a line or two of comment would have been of far greater service. These matters, however, in no way detract from the value of the main text.

A new race *Buteo platypterus cubanensis* from Cuba is described, but in such an obscure manner as readily to escape notice and with no designation of a type specimen. It is just such loose methods as this which have caused names to be overlooked and have led later to necessary changes in nomenclature and unfortunate complications.

A number of excellent halftones mainly from photographs by Mr. Alfred C. Redfield illustrate this valuable paper.—W. S.

Bent on Birds of the Aleutian Islands.—Mr. Arthur C. Bent accompanied by Messrs. Rollo H. Beck, Alexander Wetmore and Fred B. McKechnie spent the last three weeks of June, 1911, in a hurried survey of the islands of the Aleutian chain. Mr. Wetmore represented the Biological Survey of the U. S. Department of Agriculture and the expedition had in mind the securing of data for Mr. Bent's continuation of the Life Histories of North American Birds to be published by the Smithsonian Institution. The party travelled, through the courtesy of the Treasury Department, on the revenue cutter 'Tahoma' and cruised the entire length of the chain, landing on Atka, Kiska, Attu, Tanaga and Adak and the western end of Unalaska. The stops were necessarily very short, as the 'Tahoma' was due at Unalaska, July 1, and exploration was limited to the immediate vicinity of the harbors.

Mr. Bent's first publication¹ dealing with the results of the trip was a description of a new race of Ptarmigan, *Lagopus rupestris sanfordi*, from Tanaga. On each one of the more remote islands a peculiar form seems to have been differentiated. This one is said to resemble *L. r. chamberlaini* and *L. r. atkensis* from Adak and Atka Islands to the eastward, but is lighter than either.

¹A New Subspecies of Ptarmigan from the Aleutian Island. By A. C. Bent. Smithsonian Miscellaneous Collections, Vol. 56, No. 30. pp. 1-2. Jan. 6, 1912.

A second paper¹ gives a brief account of the trip, with annotated lists of sixty species found on the Aleutians and twenty-two noted in Bering Sea in July. Interesting accounts of the habits of many of the species are given and two Asiatic birds are recorded for the first time in North America—*Hypocentor rustica* the Rustic Bunting, of which two dead specimens were found and one more shot by Mr. Wetmore on Kiska Island and *Calliope calliope* the Ruby-throated Nightingale of which Mr. McKechnie shot one specimen on the same island. A specimen of *Aestrelata* nearest to *A. fisheri* was obtained at the entrance to Kiska Harbor.—W. S.

Nelson and Goldman on New Birds from Panama.—Mr. E. A. Goldman's collections while on the Smithsonian Biological Survey of Panama during the winter of 1910-11 have yielded several new species. He finds in studying the Kingfishers² which he obtained that two distinct races have heretofore been united under *Ceryle septentrionalis* Sharpe. The more northern one to which Sharpe's name is found to apply ranges the whole length of Mexico to southern Texas while the one which is here named *C. americana isthmica* ranges from Guatemala to Panama. In another paper³ Mr. E. W. Nelson describes two new forms of Nun Birds obtained by Mr. Goldman.—*Monasa fidelis* and *M. similis* each based on a single specimen.—W. S.

Mearns on New African Birds.—Dr. E. A. Mearns⁴ presents descriptions of seven new species of African Grass Warblers as a result of his study of the material obtained by the Smithsonian African Expedition. Four of these, *Cisticola subruficapilla aequatorialis*, *C. s. borea*, *C. strangei kapitensis*, and *C. hypoxantha reichenowi* were obtained by himself; two, *C. alleni* and *C. difficilis*, by Dr. Glover M. Allen who was collecting in British East Africa at the same time that Dr. Mearns was there, and one, *C. prinioides kilimensis* was obtained by Dr. W. L. Abbott in 1888.

In a later paper,⁵ *Helionympha raineyi* obtained on the Rainey African Expedition is described from the Telek River, Sotik District.—W. S.

¹ Notes on Birds Observed During a Brief Visit to the Aleutian Islands and Bering Sea in 1911. By A. C. Bent. Smithsonian Miscellaneous Collections, Vol. 56, No. 32, pp. 1-29, Feb. 12, 1912.

² A New Kingfisher from Panama. By E. A. Goldman. Smithsonian Miscellaneous Collections, Vol. 56, No. 27, pp. 1-2, December 1, 1911.

³ Descriptions of two New Species of Nun Birds from Panama. By E. W. Nelson. Smithsonian Miscellaneous Collections, Vol. 56, No. 37, pp. 1-2, February 16, 1912.

⁴ Descriptions of Seven New African Grass-warblers of the Genus *Cisticola*. By Edgar A. Mearns. Smithsonian Miscellaneous Collections, Vol. 56, No. 25, pp. 1-6, Nov. 23, 1911.

⁵ Description of a New Species of Sun Bird, *Helionympha raineyi*, from British East Africa. By Edgar A. Mearns. Smithsonian Miscellaneous Collections, Vol. 56, No. 28, p. 1, Nov. 28, 1911.

Herrick's Nests and Nest-Building in Birds.¹—Prof. Herrick's papers² unfortunately fail to reach a large number of ornithologists because of their being published in journals of animal behavior or experimental zoölogy which ornithologists too seldom consult. That they should be studied by every bird student cannot be too strongly emphasized. There is a great field in the study of the behavior of birds and unfortunately most observers are very poorly qualified to avail themselves of it, because of the prevalent tendency to judge the actions of birds as we would those of human beings and endow the authors with the same qualities that we ourselves possess. Prof. Herrick however, approaches the subject from the unprejudiced attitude of the scientific investigator and limits his deductions strictly to what is warranted by the facts so that his method as well as the results of his studies deserve careful consideration.

The present paper consists of a mass of valuable data arranged under the headings: Literature of Birds' Nests, Function of the Nest and the Problem of Protection, Classification of Birds' Nests on the basis of Behavior, Analysis of Increment Nests, Variation of Nests, Nidification, Intelligence in Nest-Building and Origin of the Instincts of Incubation and Nidification in Birds.

In this connection we can only quote some of the writer's conclusions while we recommend to all, the careful study of his papers in detail.

"Instinct alone," says Prof. Herrick, "furnishes the building impulse and in spite of many fluctuations due to experience, disturbance, or any influence of environment, holds the builders wonderfully true to their ancestral types" (p. 163).

"The proof of instinct in the nest-building activities of birds lies in the stereotyped behavior of the builders at work, as well as in the stereotyped character of the nests of different species when they are viewed in the proper light.... On the score of behavior alone the evidence is now conclusive that birds do not build their nests from imitation or experience: they require no visible standards, plan, or copy but without hesitation ... go straight to work and finish their task" (p. 163).

"Nest-building is one of a series of complex and correlated instincts pertaining to the reproductive cycle of birds, ... [i. e. migration, mating, nest-building, egg-laying, care of the young, etc.] these serial instincts do not invariably proceed in due order and harmony.... The cycle may be normally repeated more than once in the season, and when begun it may be brought to a sudden close not alone through accident or fear, but by the rise of other instincts or by any disturbance which affects the usual

¹ Nests and Nest-Building in Birds: in Three Parts. By Francis H. Herrick, *Journal of Animal Behavior*. Part I. May-June, 1911, pp. 159-192; Part II. July-August, 1911, pp. 244-277; Part III, September-October, 1911, pp. 336-373.

² Cf. also. Life and Behavior of the Cuckoo. *Journal of Experimental Zoölogy*. Sept. 1910, pp. 169-233, and Instinct and Intelligence in Birds. *Popular Science Monthly*, June, July and August, 1910.

rhythms. To such causes are due some of the most extraordinary phenomena of nests and nest life, such as the 'cuckoo instinct,' double, compound, or superimposed nests, the desertion of the last young, etc." (p. 336).

While criticising most of the literature of nest-building Prof. Herrick also points out the difficulties with which students of the subject have to contend — especially the necessity for continuous observation for hours and even days. "In spite of such drawbacks, however, it would be difficult to name a field in the province of behavior where the right kind of study promises more interesting results the world over, and where some of the phenomena to be witnessed close to your door, may be as worthy of record as anything observed in the forests of Brazil or of Africa."—W. S.

Beebe and Crandall on The Undescribed Juvenal Plumage of the Yucatan Jay.¹—The plumages and molt of specimens of *Cissilopha yucatanica* living in the New York Zoological Park, are here described. When received they were in full juvenal plumage with the entire head and underparts white. This changed at the post-juvenal molt to the usual black, and subsequently the white tipped rectrices were replaced by those of uniform blue while the mandibles and eye ring eventually became black. The yellow bill is thus a character of immaturity and not sexual, as has sometimes been supposed. The early white breasted plumage in this species was quite unexpected.—W. S.

Henshaw's Report of the Chief of the Biological Survey for 1911.²—The important work of this branch of the U. S. Department of Agriculture in its efforts to protect the useful birds and game of the country and to check the depredations of noxious species, is too well known to require detailed notice in this connection, but anyone who reads Mr. Henshaw's interesting report will be astonished at the varied fields in which the activities of the Survey are carried on, and the benefits that they render to the Agricultural and other interests of the United States. Special ornithological investigations of the year have dealt with the Birds of Arkansas, the Food of Woodpeckers, the Food of Wild Waterfowl, while field work has been prosecuted in Alabama, Idaho, Arkansas, Kentucky, Montana, Tennessee, Wyoming and Virginia.—W. S.

Townsend's Captain Cartwright and his Labrador Journal.³—Dr. Charles W. Townsend already well known for his writings on the

¹ The Undescribed Juvenal Plumage of the Yucatan Jay. By C. William Beebe and Lee S. Crandall, *Zoologica, Scientific Contributions of the New York Zoological Society*. Vol. I, No. 7, pp. 153–156, with colored plate, December 5, 1911.

² Report of the Chief of the Bureau of Biological Survey for 1911. By Henry W. Henshaw. *Annual Reports of the Department of Agriculture* 1911, pp. 1–20.

³ Captain Cartwright and his Labrador Journal, edited by Charles Wendell Townsend, M. D. Author of "Along the Labrador Coast," "A Labrador Spring," "The Birds of Essex County" and joint author of "Birds of Labrador with an Introduction by Dr. Wilfred T. Grenfell | Illustrations from Old Engravings, Photographs, and a Map. | vignette | Boston | Dana Estes & Company | Publishers | 1911. 8vo., pp. 1–xxxiii + 1–385.

natural history of Labrador, has edited a reprint of the journal of Captain George Cartwright the famous explorer of this interesting but inhospitable coast. The original edition of the journal published in 1792 is a very scarce work and is inaccessible to most readers, so that Dr. Townsend's reprint is exceedingly welcome, placing at our disposal a vast amount of accurate and interesting information concerning Labrador and its natural history, one hundred and thirty years ago. The text is preserved without change except for the omission of "unimportant details and the mass of repetition," while in foot-notes the editor has given us the current technical names of the animals and plants which are referred to and as a foreword has furnished an entertaining biographical sketch of Captain Cartwright.

Most striking among the numerous allusions to birds are the references to the Great Auk or 'Penguin' the most extended of which treats of its threatened extermination on Funk Island, where in 1785 the inhabitants of Fogo went with their boats for birds and eggs. "They lay their gang-boards from the gunwale of the boat to the rocks, and then drive as many penguins on board, as she will hold.... It has been customary of late years, for several crews of men to live all the summer on that island, for the sole purpose of killing birds for the sake of their feathers, the destruction which they have made is incredible. If a stop is not soon put to that practice, the whole breed will be diminished to almost nothing, particularly the penguins: for this is now the only island they have left to breed upon."

Captain Cartwright's respect for accuracy in describing the habits of birds and mammals is conspicuous, the more so because it is unusual in explorers of his time, and this trait as well as his sense of humor are well shown in his extended account of the Beaver which he begins as follows: "I tremble at seeing myself under the necessity of contradicting that celebrated natural historian Compt de Buffon; yet I must take the liberty to do it. He says, 'A beaver has a scaly tail, because he eats fish.' I wonder much that Monsieur Buffon had not one himself for the same reason; for I am sure that he has eaten a great deal more fish, than all the beavers in the world put together."

All naturalists especially ornithologists and mammalogists will find this volume exceedingly interesting reading and a valuable work of reference.—W. S.

Taylor on Birds of Northern Humboldt County, Nevada.—In an interesting report¹ Mr. Walter P. Taylor describes a field trip made by himself and Mr. Charles H. Richardson, Jr. in the Pine Forest Mountain region of Nevada May 10–August 10, 1909.

¹ Field Notes on Amphibians, Reptiles and Birds of Northern Humboldt County, Nevada; with a discussion of some of the Faunal Features of the Region. By Walter P. Taylor. University of California Publications in Zoology, Vol. VII, No. 10, pp. 319–436. February 14, 1912.

Careful descriptions of the localities visited are given, with lists of the more conspicuous plants, while the life zones and their characteristic species of vertebrates are thoroughly discussed. The annotated list of birds numbers 103 species, and considerable space is allotted to accounts of the habits of those which are most abundant and characteristic. To quote the author, the attempt has been made to place emphasis upon the non-morphological or psychological characters of the species which are of late attracting more and more attention in zoological field work.

In addition to the birds, the reptiles and amphibians of the region are treated in this paper, the mammals having formed the subject of a previous contribution. Taken together they form a comprehensive biological survey of this interesting portion of Nevada, with much valuable information upon the life histories of the birds.—W. S.

Swarth, on A Collection of Birds from Vancouver Island.¹—An expedition was organized and financed by Miss Annie M. Alexander in 1910 in the interests of the University of California for the purpose of collecting the higher vertebrates of Vancouver Island. Miss Alexander, Miss Louise Kellogg, Mr. Harry S. Swarth and Mr. E. Despard made up the party and Mr. Swarth here presents us with a detailed account of the localities visited and a discussion of the distribution and relationship of the birds and mammals, the former comprising 111 species.

Several Pine Grosbeaks were observed on July 15 and a male in juvenal plumage was secured showing pretty conclusively that a form of this bird which Mr. Swarth refers provisionally to *Pinicola enucleator flammula* breeds on the island.

The extensive material obtained made possible a careful study of the affinities of the Vancouver representatives of several species which has led to interesting results. The Savannah Sparrow is found to be 'widely different' from *Passerculus s. alaudinus* and 'practically indistinguishable' from *P. s. savanna* of eastern North America. The Nighthawk too, is the eastern form *Chordeiles v. virginianus* and the Crossbill *Loxia curvirostra minor*, while the Junco is *J. h. oregonus*. In a large series of Song Sparrows from Vancouver and southern Alaska Mr. Swarth fails to "perceive the differences supposedly distinguishing *morphna* from *rufina*," while the Northwest Crow is treated as a subspecies of *C. brachyrhynchos*.

Certain forms not recognized in the A. O. U. Check-List are held to be valid as *Hirundo erythrogastra palmeri*, *Dendroica aestiva hooveri*, *Ceryle alcyon caurina*, and *Geothlypis trichas scirpicola* while certain differences are noted in the vernacular names. A strong plea too is made for the restriction of the name *ruber* to the northern instead of the southern form of Red-breasted Sapsucker, which deserves careful consideration. Indeed

¹ Report on a Collection of Birds and Mammals from Vancouver Island. By Harry S. Swarth. University of California Publications in Zoology. Vol. 10, No. 1, pp. 1-124, pl. 1-4. February 13, 1912.

Mr. Swarth's paper is well worthy of detailed study and is a noteworthy contribution to west coast ornithology.—W. S.

Mathews' The Austral Avian Record.¹—This journal is issued at irregular intervals in connection with the Austral Avian Museum, Watford, Herts, England, by Mr. Gregory M. Mathews. It is intended to comprise such notes as require immediate attention in connection with the author's 'Birds of Australia' now in course of publication. Descriptions of new forms, notes on nomenclature and any other interesting matter relating to the Australian avifauna will be included. The present number comprises notes on Australian Cuckoos in which the nomenclature of all the forms is discussed, *Owenavis* and *Neochalcites* appear as new genera and ten new species and subspecies are proposed. A second note is a useful table of the dates of issue of the parts of Lear's 'Psittacide' and Müller's 'Verhandeligen over de Natuurlijke Geshiedenis. Land-en Volkenkunde.' We do not think that Mr. Mathews' proposal to ignore Lesson's group or "race" names which have always been given recognition as genera will meet with the approval of ornithologists, nor do we consider that the authors of the International Code ever intended that article 2 should be interpreted as rejecting group names not explicitly designated by their proposers as genera or subgenera.—W. S.

Parkins' Record of Sales of the Great Auk and its Eggs.²—This is an interesting pamphlet containing a record of sales of specimens of the Great Auk or its eggs at public auction in Great Britain from 1806 to 1910. The early history of the specimens is included so far as it is known, and the character of this information will be seen by consulting Col. Thayer's article on p. 208 of this number of 'The Auk.' There are several interesting illustrations.—W. S.

Jacobs' The American Bird House Journal for 1912.³—Under this title Mr. J. Warren Jacobs proposes to issue an annual publication in continuation of his well known series of papers dealing with the history of

¹ The Austral Avian Record. A Scientific Journal devoted primarily to the Study of the Australian Avifauna. Vol. I, No. 1. Issued in connection with the Austral Avian Museum, Watford, Herts, England. Editor, Gregory M. Mathews. Price 1/6 Net. Witherby & Co., 326 High Holborn, London, W. C. January 2nd, 1912.

² The Great Auk. A Record of Sales of Birds and Eggs by Public Auction in Great Britain, 1806-1910. With Historical and Descriptive Notes and five Plates. (Extra Paper to Part 6, of Vol. I., Hastings and East Sussex Naturalist.) By Thomas Parkin, M. A., F. L. S., F. Z. S., (Member of the British Ornithologists' Union). Hastings, Burfield & Pennells Ltd. MCMXI. (Price two shillings.)

³ The American Bird House Journal for 1912, published by the Jacobs Bird House Co. Waynesburg Pa., pp. 95-141. Price, 25 cents.

the Purple Martin, though the scope will be broadened to include various other species of birds which nest in boxes. The present issue contains many excellent halftones of bird houses and Martins' nests together with much valuable information regarding the economic value of the Martin to fruit-growers and reports from Martin colonies in various parts of the country.— W. S.

Worcester on Newly Discovered Breeding Places of Philippine Sea Birds.— In this interesting paper¹ Dr. Worcester describes the Terns and Boobies found breeding upon various Philippine reefs and sandbars visited by him during the summer and autumn of 1910 and illustrates his account by a series of most interesting photographs.

The Terns observed were *Sterna borealis*, *furcata*, *melanauchen* and *gracilis* and *Anous stolidus*. On Bankoran Island were quantities of Boobies; the red-footed *Sula piscator* nesting in the trees, while the brown species *S. leucogastra* nested on the ground; nests of the latter being frequently plundered by the Red-footed Boobies which were seeking nesting material.

On Usong Island was a colony of *Sula cyanops* which like *Sterna gracilis* had not previously been recorded from the Philippines. A female of this Booby was found mated to a male *S. leucogastra* and three evident hybrids between the two were secured.²

On Cavilli Island great numbers of a new Tern, *Micranous worcesteri*, described in a recent paper³ by Mr. McGregor, were found nesting in the trees while the abundance of Frigate-birds, *Fregata aquila*, suggested that they also would be found breeding there at the proper season.— W. S.

Gunning and Roberts on South African Birds.⁴— Those interested in studying the various collections of African birds which have lately been brought to America will find this paper with its descriptions of twenty-two new species and subspecies, well worthy of consultation. Some details in the authors' method of treatment are however open to criticism. Instead of citing one type specimen, they cite two, a male and female and often from different localities; while the method of using Roman numerals for the months only adds to the possibilities of typographical errors, as seen on p. 111 where we find "31 IX. 08," surely an error unless September has an extra day in South Africa.— W. S.

¹ Newly Discovered Breeding Places of Philippine Sea Birds by Dean C. Worcester. The Philippine Journal of Science and General Biology, Ethnology and Anthropology, vol. VI, No. 4. August, 1911. pp. 167-177, pll. i-viii.

² Hybridism among Boobies. By Dean C. Worcester, do. p. 179-181, pl. 1.

³ Record of a Puffinus new to Philippine Waters and Description of a New Species of Micranous. By Richard C. McGregor.

⁴ New Records and Descriptions of New Species of Birds in the Transvaal Museum Collection. By Dr. J. W. B. Gunning and Austin Roberts. Annals of the Transvaal Museum. July, 1911. pp. 109-118.

Hellmayr on the Ornithology of Western Colombia.¹—While the bird life of northern Colombia is becoming fairly well known there is still much to be learned regarding that of other parts of this interesting country especially the southern and central portions. The present paper is a welcome contribution covering as it does portions of the province of Choco, including the tropical San Juan valley and the Pacific slope of the Western Cordillera near its headwaters.

The basis of Mr. Hellmayr's paper is a collection of about 700 specimens obtained by Mr. Mervyn G. Palmer during 1908 and 1909, representing 201 forms. There are valuable critical notes and discussions of the details of distribution of the various species as well as a chapter of 'Conclusions' in which it is shown that many species of this region are common to N. W. Ecuador while a smaller number are Central American. Twenty-seven are listed as peculiar to Western Colombia. *Calospiza gyroloides bangsi* from Chiriqui, *C. g. catharinae* from S. E. Peru, *Arremon aurantirostris occidentalis* from W. Colombia and *Myrmotherula surinamensis pacifica* from W. Colombia are described as new.—W. S.

Berlepsch's Revision of the Tanagers.²—This is a valuable work of reference for students of neotropical birds, especially since we have had no monographic review of the Tanagers since Dr. Sclater's volume XI of the Catalogue of Birds in the British Museum, published twenty-five years ago. Count von Berlepsch lists 555 forms using binomial names for 403 and trinomials for 152. The exact reference and type locality are given for all accepted names and synonyms, and a full list of localities is quoted under each species while type species are given for all generic names. Critical remarks on many of the species are given as an appendix to the main text, while matters of classification and nomenclature are dealt with in the introduction. The author disagrees with Ridgway's action in removing the Pitylinæ to the Fringillidæ and in placing *Hemispingus* with the Mnioiltidæ and prefers to keep them with the Tanagers, while *Iridophanes* he would exclude from the latter group keeping it with the Coerebidæ. *Calyptophilus* he regards as a member of the Ampelidæ. In matters of nomenclature he finds himself unable to adopt such generally current forms as *Calospiza nigriviridis nigriviridis* preferring the binomial for the typical race, nor does he follow original misspellings of geographical names.—W. S.

Rivista Italiana di Ornitologia.³—Under this title appears the first

¹ A Contribution to the Ornithology of Western Colombia. By C. E. Hellmayr. Proceedings Zoological Society of London, 1911, pp. 1084-1213 (published December, 1911).

² Revision der Tanagriden. Von Hans Graf von Berlepsch. Sonderabdruck aus: Bericht über den V. Internationalen Ornithologen-Kongress. Berlin, 1910, pp. 1001-1161.

³ Rivista Italiana di Ornitologia. Edita da: Ettore Arrigoni degli Oddi, Filippo Cavazza, Francesco Chigi, Alessandro Chigi, Giacinto Marlorelli, Tommaso Salvadori. Anno I. Num. 1-2, Luglio-Settembre, Ottobre-Dicembre, MCMXI. Bologna, Novembre, 1911.

number of a quarterly journal of Italian ornithology edited by Count Arrigoni Degli Oddi and five others. It is a 'double number' with a colored plate of a hybrid pheasant, *Diardigallus diardi* \times *Gennaeus*, and is a well printed and very creditable publication.

A paper by T. Salvadori treats of the relationship of *Saricola aurita* and *S. stapazina*. The editor and Dr. G. Damiani describe a collection of birds from the Tuscan Archipelago. The reversion to ancestral characters in a specimen of *Falco vespertinus* is described by F. Chigi and other papers are by A. Chigi on the migration of the Common Gull from the Baltic to Italy, by E. Balducci on the capture of *Pelecanus crispus* in Italy and by G. Martorelli on the hybrid pheasant already mentioned. Numerous short notes and extended reviews complete the number.—W. S.

'Cassinia.' —An epoch in the history of this publication is marked by the resignation from the editorship, of Mr. Witmer Stone, who had so admirably guided the course of the ten preceding volumes of the same name, as well as the four earlier volumes of the Proceedings of the Delaware Valley Ornithological Club. All that Dr. J. A. Allen has been to the Bulletin of the Nuttall Ornithological Club and 'The Auk,' Mr. Stone was to Cassinia and its forerunner. Mr. Robert Thomas Moore, the new editor, fully recognizes the valuable services of his predecessor, and promises to maintain as nearly as possible the high standard set. So far as the present volume is concerned this promise has been amply redeemed. Mr. Moore urges the detailed study of the life-histories of birds, as the best work to which local students of ornithology can now turn their hand. The character of his paper on the nesting habits of the Least Sandpiper, presented at the Philadelphia meeting of the American Ornithologists' Union, November, 1911, proved that he is fully qualified to lead such a movement.

The contents of the present volume of Cassinia are the following: Constantine S. Rafinesque as an Ornithologist, By Samuel N. Rhoads; The frontier of the Carolinian fauna in the lower Delaware valley, By Spencer Trotter; The Center Furnace swamp, By Richard C. Harlow; Recollections of the Passenger Pigeon, By Herman Behr; The summer of fire and bird adaptation, By Cornelius Weygandt; Down the Pocomoke, By George Spencer Morris; General notes; Report of the spring migration of 1911, Compiled by Witmer Stone; Abstract of the Proceedings of the Delaware Valley Ornithological Club, 1911; Club notes [Editorial]; Necrology; Bibliography of papers published in 1911, relating to the birds of Pennsylvania, New Jersey and Delaware; list of officers and members and index.

The report on migration shows that the accumulation of records by the Delaware valley club are beginning to tell. Generalizations are now possible, and as Mr. Stone remarks: "by the method of computing 'bulk arrival' we are now getting remarkably accurate results." —W. L. M.

¹ Cassinia, A bird annual. Proc. of the Del. Valley Ornithological Club of Philadelphia, No. XV, 1911. 80 pp., 3 pll., Feb. 1912.

The Ornithological Journals.—As many of the ornithological journals, especially those published in foreign countries, are seen by but a comparatively small proportion of the readers of 'The Auk,' it seems that a brief résumé of their contents would be a desirable addition to each installment of RECENT LITERATURE. In accordance with this idea, the titles of the more important papers, beginning with January 1, 1912, will be given, followed in some instances by a few words of comment. Purely local articles in foreign journals as well as minor notes, etc., will be omitted while matter relating directly or indirectly to North American ornithology or general bird-study will be given especial attention. In this way readers may learn of papers dealing with subjects of special interest to them of which they would otherwise fail to hear. This plan will not, of course, interfere with the more extended reviews under separate headings of important excerpts received from the authors, which will be continued as heretofore.

Bird Lore. Vol. XIV, No. 1. January-February, 1912.

My experience with Von Berlepsch Nesting-boxes. By F. H. Kennard.

A Glimpse into the Life History of the Turkey Vulture. By R. W. Williams.

A Myrtle Warbler Nest. By William Pepper.

Twelfth Christmas Bird Census — 217 lists!

Illustrations, Migrations, and Plumages of the Crossbill. In the series on North American Sparrows.

The White Egrets. By T. G. Pearson. Educational Leaflet No. 54, with two colored plates.

The Condor. Vol. XIV, No. 1. January-February, 1912.

The Shore Birds of Santa Barbara. By J. H. Bowles and A. B. Howell.—With interesting photographs of Phalaropes.

Through Tahoean Mountains. By M. S. Ray.

A Visit to Nootka Sound. By H. S. Swarth.

Some Birds of Southwestern Montana. By A. A. Saunders—Annotated list of 149 species.

Birds of a Mohave Desert Oasis. By Chester Lamb — 134 species found near Daggett, California.

The Ibis. IX Series. Vol. VI, No. 21. January, 1912.

On the Birds collected by Mr. Claude H. B. Grant at various Localities in South Africa. By W. L. Sclater with Field Notes by the Collector (Concluded).

Notes on the Ornithology of Corsica, Part III. By Rev. Francis C. R. Jourdain.

On the Birds of Mauritius. By Capt. R. Meinertzhagen.—Fifteen of the native species are now protected by law.

On some newly described Birds of Paradise, and some Undescribed Eggs of the same Group. By Hon. Walter Rothschild.—*Pardigalla brevicauda* Rothschild & Hartert figured.

On the Eggs of certain Birds-of-Paradise. By W. R. Ogilvie-Grant.—

Refers to the wonderful aviaries of Mr. E. J. Brook at Hoddam Castle where there were living at one time twenty-three species of Paradise and Bower Birds and where two have nested.

Descriptions of two new Species and a new Genus of Australian Birds. By Alfred J. North—*Neositta mortoni*, *Alcyon ramsayi* and *Trichodere* nov. gen. for *Ptilotis cockerelli* Gould.

Field-Notes on a Collection of Birds from the Mediterranean. By Commander H. Lynes. With Systematic Notes by H. F. Witherby.—The nomenclature of this paper seems strangely out of place on the conservative pages of 'The Ibis.' Trinomials are used throughout but while the editors allow such names as *Emberiza calandra calandra* and *Chloris chloris aurantiiventris*, they take pains to explain in foot-notes that they are unable to permit such a name as *Petronia petronia petronia* and have stricken out one of the repetitions!

Under 'Letters and Notes.' Mr. Mathews makes another appeal to the B. O. U. for the rejection of Brissonian Genera and for the transference of *Saxicola* from the Wheatear to the Chats (*Pratincola*). In the latter case he seems to entirely overlook the fact that the International Code does not recognize type fixing by restriction except where a genus consists of but two species (opinion 6). The first actual designation of a type for *Saxicola* is by Gray, 1841, who designated *S. ananthe*.

Bulletin of the British Ornithologists' Club. No. CLXXV.

Hon. Walter Rothschild describes a new Cassowary, *Casuarius keysseri* and discusses the relationships of the thirty species and subspecies now known, of which by the way he has described exactly one half. There was a general exhibition and discussion of Capercaillie, Black Grouse and Pheasants in which males were assuming female plumage and vice versa. Mr. Witherby regarded the abnormal feathers as not exactly like those of the opposite sex and suggested that the cause was probably not related to the sexual organs. Mr. Pycraft thought that "the assumption of female plumage by males was due to a lack of 'tone' or vitality at the time of moulting."

Journal für Ornithologie. LX. Heft. 1, January, 1912. Studies on the Avifauna of Emsland. Dr. Edwin Detmers.

The Distribution of the Genus *Emberiza*. Dr. H. Duncker. With maps showing lines of dispersal of the various groups of species.

The Zoologist. No. 847. January 15, 1912.

The Prehistoric Origin of the Common Fowl. By Fredk. J. Stubbs and A. J. Rowe.

The Emu. January, 1912. Vol. XI, Part 3.

Eleventh Session of the Royal Australasian Ornithologists' Union.

Bush Birds of New Zealand. By J. C. McLean. Part III.

Relative Dimensions of Red Blood Cells of Vertebrates, especially of Birds. By J. Burton Cleland and F. Harvey Johnston.

Avifauna of New South Wales Islands. By A. F. Basset Hull. Part II.

Bird-Life in the Riverina. By Capt. A. S. White.

British Birds. January 1, 1912. Vol. V, No. 8.

Dr. L. Bureau's work on the Partridge. By N. F. T.—A review in English of this recent volume which comprises probably the most detailed study of molt in live birds that has yet appeared.

The North American Peregrine in Lincolnshire and Leicestershire. By G. H. Eaton Haigh.

British Birds. February 1, 1912. Vol. V, No. 9.

Breeding and "Eclipse" Plumages of the Common Partridge. By W. R. Ogilvie-Grant.—A phase not hitherto recorded, perhaps analogous to one of the plumages of the Ptarmigan.

The Avicultural Magazine. Vol. III. No. 3. January, 1912.

A Rocco in Italy by Hubert D. Astley.—An interesting account of the device for catching migrating birds.

The Blue Robin (!) *Sialia sialis*. By Catharine Currey.—An account of our Bluebird as a cage bird.

A Jay New to Aviculture, *Calocitta lidthii* Hubert D. Astley.—It is but a few years ago that this rare Loo Choo *Garrulus* was known only from Bonaparte's description. This is probably the first time that it has been placed in the genus *Calocitta*!

The Avicultural Magazine. Vol. III. No. 4. February, 1912.

Some Notes on the Secretary Bird. By Major Horsbrugh and W. H. St. Quentin.—Habits of wild and captive birds.

Notes on a Storm Petrel in Captivity. By C. B. Ticehurst.—The bird *Procellaria pelagica*, always stood on the entire tarsi, only rising on the toes when flapping the wings at the beginning of flight.

Publications Received.—Beebe, C. William and Crandall, Lee, S. The Undescribed Juvenal Plumage of the Yucatan Jay. Zoölogical Scientific Contributions of the New York Zoological Society, Vol. I, No. 7, 1911.

Bent, A. C. Notes on Birds Observed During a Brief Visit to the Aleutian Islands and Bering Sea in 1911. (Smithson. Misc. Coll. 56, No. 32, 1912.)

Berlepsch, Hans Graf von. Beschreibung neuer Vogelformerans dem Gebiete des unteren Amazonas. (Ornith. Monatsberichte Februarheft 1912, pp. 17-21.)

Berlepsch, Hans Graf von. Revision der Tanagriden. (Bericht über den V. Internationalen Ornithologen-Kongress, Berlin, 1910, pp. 1001-1161.)

Campbell, A. J. A History of Australian Ornithological Research. (Emu, XI, Pt. 3, 1912, pp. 153-157.)

Goldman, E. A. A New Kingfisher from Panama. (Smithson. Misc. Coll. 56, No. 27, 1911.)

Hellmayr, C. E. Description de Trois Nouvelles Espèces d'Oiseaux des Familles de Dendrocolaptides et Formicariides. (Rev. Française d'Orn. Nos. 24 et 24 bis 1911.)

Hellmayr, C. E. A Contribution to the Ornithology of Western Colombia. (Proc. Zool. Soc. London, 1911, pp. 1084-1213.)

Hellmayr, C. E. Ueber neue und seltene Vögel aus Südperu. (Verhandl. Ornith. Gesells. in Bayern XI, 1912, pp. 159-163.)

Hellmayr, C. E. und Seilern, Josef Graf von. Beschreibung eines neuen Dendrocoloptiden aus Venezuela. (Verhandl. Ornith. Gesells. in Bayern XI, 1912, pp. 157-158.)

Henshaw, H. W. Report of the Chief of the Bureau of Biological Survey for 1911. (Ann. Rep. U. S. Dept. Agr.)

Mearns, E. A. Description of Seven New African Grass-Warblers of the genus *Cisticola*. (Smithson. Misc. Coll., 56, No. 25, 1911.)

Mearns, E. A. Description of a New Species of Sunbird, *Helionympha raineyi*, from British East Africa. (Smithson. Misc. Coll. 56, No. 28, 1911.)

Nelson, E. W. Description of two new species of Nun Birds from Panama. (Smithson. Misc. Coll., 56, No. 37, 1912.)

Parkin, Thomas. The Great Auk. A Record of Sales of Birds and Eggs by Public Auction in Great Britain 1806-1910. (Hastings and East Sussex Naturalist Extra Paper to Pt. 6, Vol. I). Hastings, Burfield & Pennells Ltd. 1911. Price, 2 shillings.

Pycraft, W. P. A History of Birds. Methuen & Co. London. 1910. 10 s. 6 d. net.

Ridgway, Robert. The Birds of North and Middle America. Part V., Bull. 50, U. S. Nat. Mus., 1911.

† **Sclater, W. L.** A History of the Birds of Colorado. Witherby & Co. London. 1912. \$5.

Shufeldt, R. W. American Wild Fowl I-II. (Amateur Sportsman, Jan.-Feb., 1912.)

Shufeldt, R. W. Study of Birds' Eggs. (Emu, XI, Pt. 3, 1912.)

Swarth, H. S. Report on a Collection of Birds and Mammals from Vancouver Island. (Univ. of California Publ., Zoology, X, No. 1, pp. 1-124. Feb. 13, 1912.)

Taylor, W. P. Field Notes on Amphibian, Reptiles and Birds of Northern Humboldt County, Nevada. (Univ. of California Publ., Zoology, VII, No. 10, pp. 319-436, Feb. 14, 1912.)

Townsend, Charles W. Captain Cartwright and his Labrador Journals. Boston, Dana Estes & Co., 8vo. 1911.

Wallace, John H., Jr. Alabama Bird Day Book. Issued by the Department of Game and Fish. 1912.

Abstract Proc. Zool. Soc. London, No. 104, 1912.

Animals, Friend XVIII, No. 4, January, 1912.

Austral Avian Record, I, No. 1.

Avicultural Magazine, (3) III, Nos. 3-5, Jan.-Mar., 1912.

Bird-Lore, XIV, No. 1, Jan.-Feb., 1912.

British Birds, V. No. 8-10, Jan.-Mar., 1912.

Bulletin Charleston Museum VIII, No. 3, Mar., 1912.

Cassinia, No. XV, 1911 (Mar., 1912).

- Condor**, The, XIV, No. 1, Jan.-Feb., 1912.
Emu, The, XI, Part 3, Jan., 1912.
Forest and Stream, LXXVIII, Nos. 1-12, 1912.
Ibis, The (9) VI, No. 21, Jan., 1912.
Journal Maine Orn. Soc., XIII, No. 4, Dec., 1911.
Messenger Ornithologique, No. 1, 1912.
Oologist, The, XXIX, Nos. 1-3, Jan.-Mar., 1912.
Ornithologische Monatsschrift, XXXVI, No. 12, December, 1911.
Philippine Journal of Science, VI, Nos. 4-5, Aug.-Nov., 1911.
Proceedings Acad. Nat. Sci., Philadelphia, LXIII, Pt. 3, 1911.
Records of the Australian Museum, IX, No. 2, Oct., 1911.
Revista Italiana di Ornitologia, I, 1-2, July-Dec., 1911 (Nov., 1911).
Science, N. S., XXXV, Nos. 888-899, 1912.
Wilson Bulletin, XXIV, No. 5, Mar., 1912.
Zoölogist, The (4) XVI, No. 181, Jan., 1912.

CORRESPONDENCE.

The Photography of Birds' Eggs.

TO THE EDITOR OF 'THE AUK':—

Dear Sir:—A number of years ago I published several articles on my methods of photographing the eggs of birds, and at that time the subject was attracting considerable attention. Mr. Henry E. Dresser, then engaged upon his *Eggs of the Birds of Europe*, sent me several of his colored plates of eggs for my criticism with respect to the selection of backgrounds. They were the most beautiful things of the kind I had ever seen, and, in fact, I had one or two of them framed for my study. Besides being far ahead of my own achievements in that line, they were elegantly colored and true to nature. Mr. Dresser never wrote me how he made his photographs of birds' eggs, which latter, as we know, stand among the most difficult of all small, inanimate objects representing biological material that the naturalist seeks to obtain photographs of for illustrative purposes. Some ten or fifteen years ago, when I first undertook to photograph birds' eggs, the success I met with was only partial. In those days I used to stick the blown eggs on to a vertical pane of glass with a piece of soft wax. Care was taken that the glass was free from all blemishes (air-bubbles, etc.), and the eggs could be arranged as desired and as they were to appear in the photograph for reproduction and publication. A background of any selected kind was firmly fixed at a proper distance behind the glass and in a plane parallel to it. In setting up the camera to make the exposures, it was done so that the visual axis or line passing through the lens was perpendicular to these planes, and at a middle point of the egg or eggs to be photographed.

There are several serious objections to this method, which need not be touched upon here, and I have abandoned it long ago.

No one will question the value of perfect photographs of birds' eggs to the general ornithologist, and, if possible, it is highly desirable that he should be able to make them for himself. Therefore no apology appears to be necessary for pointing out here the best way to go about it.

In the last issue of *The Emu* (Jan., 1912), the official publication of the Royal Australian Ornithologists' Union, I published an article on a "Study of Birds' Eggs," which is illustrated by three plates reproduced from recent photographs of mine of birds' eggs from Australia and elsewhere. Mr. Campbell, the editor of *The Emu*, speaks well of the execution of these photographs, and, as I have received many inquiries as to the technique of this class of work, the object of the present letter is to give some of my experiences in regard to it.

To obtain perfect photographs of birds' eggs, natural size, one must use the very best of photographic material, and a camera and lens suitable for the purpose. This is a part of the subject which space cannot here be expended upon, and I take it the photographer is an experienced one, for no amateur should commence by selecting birds' eggs as his subjects, for, with his untrained eye, he will never get them.

By the method here to be described the eggs may be blown or unblown when photographed; or they may be of any size, from an egg of a hummingbird to one of an ostrich; or of any color, and these last may be handled by the use of color screens and isochromatic plates.

When intended for reproduction, it is best to bring them up on the ground-glass somewhat above natural size, so the half-toners can sharpen them by reduction to the size required, be that smaller or the same as the specimen.

It is surprising how many things one must bear in mind when one undertakes to photograph a single, medium-sized egg of a bird; and the difficulties are markedly increased when the attempt is made to photograph eggs of different sizes, perhaps a dozen together, all on the same negative. (*The Emu*, Jan., '12, Plate XX).

Now we will take an example, and say a photograph (in which the eggs are to be somewhat larger than the specimens) of three eggs of the Murre (*Uria l. troile*) is desired, and all three on the same negative. Mr. Edward J. Court, an Associate of A. O. U., kindly loaned me for the purpose, from his superb collection, the very examples I needed. Here a 5 × 8 camera is required, and a 5 × 7 would not have answered. Any high-class lens will do that will not distort the object when made either natural size or somewhat above it. Eggs taken without shadows are usually flat and unattractive. Let the light come from three or more sources, and then control it so as to obtain shadows which will be soft, diffuse, and enhance the beauty of the result. Have the aspect of each egg you desire to show in the resulting negative toward the camera, and, what's more, so that it will show as you want it when photographed.

Where the light is exactly right in your studio, and will remain so sufficiently long for your purpose, spread on the floor your background, which may be a square yard of black velvet, or white blotting-paper, or other material according to the kind of eggs you are to photograph and the result you desire to obtain. Here I used white blotting-paper, a large-sized sheet. Again, governed by the light, place on this background two convenient supports of precisely the same height. Their tops must be smooth, exactly in the horizontal plane, and broad enough to support a perfect pane of glass (very thin, 14×20), so that it, too, is horizontal, and will remain perfectly steady in its place. Arrange your vertical camera above this contrivance, so that the imaginary visual line is perpendicular to the floor, and passes through the center of the pane of glass. This latter rests on the supports near the margins of the short sides, thus fulfilling the required conditions as given above.

Best try a single egg first, so as to study the focus, the reflections, the light and the shadows, and numerous other points before placing all three eggs on the upper surface of the glass where they are eventually to rest to be photographed.

Everything depends upon keeping the egg in the exact position you want it during the exposure. It must rest upon the glass in such a way that you can move it at will in any direction, and have it stay there. This I accomplish by placing beneath it a little pile of wheat flour,—just enough so it will not be seen in the resulting negative. This keeps the egg off the glass, thus running no risk of breakage or soiling, permitting the specimen to be instantly turned in *any direction*. In fact, by this simple scheme we can study the egg from all points of view, and have it in the exact position to make a scientific photograph of it. Moreover, when the three eggs are on the glass, resting upon their three little piles of flour, we can in a moment get their axes parallel; study the shadows; rotate them to the sides we wish to photograph, and so on. In the case of eggs the shape of Murres' eggs (see Plate), we must make sure that the apices do not dip down or up, so as to *shorten* any egg in the picture we get. In all cases, the long axis of the egg must be parallel to the plane of the glass upon which it rests, and likewise parallel to the egg or eggs on either side of it, or, in some instances, in the same line with axes of eggs before or behind it. Where eggs of various sizes are taken on the same plate, I support the smaller ones on appropriate stalks of soft wax, so they may be turned in any direction.

These are some of the main points in the photography of eggs to be looked after, and experience and observation must do the rest, as space here will not admit of pursuing the subject any further.

Yours very truly,

R. W. SHUFELDT.

A History of the Birds of Colorado.

TO THE EDITOR OF 'THE AUK':—

Dear Sir:—Mr. Selater's splendid work, *A History of the Birds of Colorado*, eagerly expected for some time, is now at hand, and certainly fulfils all expectations. It is well-printed with good type on un-glazed paper, hence easily readable and the arrangement is all that could be desired. In going through the pages it seems to me that the references are as nearly complete as could be expected, but in such a work some omissions are almost inevitable. The most noticeable one which attracts my attention is Felger's "*Birds and Mammals of Northwestern Colorado*," which is listed in the bibliography, but all or nearly all of his records therein are omitted from the text, including a few rather important ones. This is not offered by way of criticism, but merely to call the attention of ornithologists to the fact that there are uncited records of some of the species. With such an excellent list as a foundation, this would be a good time for all who have worked in this region to go through the book in a search for the rarer species or species of limited distribution in the state, and publish in 'The Auk' or Condor any really important records they may have which would add essentially to our knowledge of the distribution of the less known species. Of course all ornithologists will not agree with all that the author of this work says, but in most cases when he departs from the beaten path he is perfectly fair with the reader. He does not directly admit the validity of the Red-wing subspecies *Agelaius phoeniceus fortis*, except by including it in the key to the genus, but he fairly states the situation. Felger's record of *A. p. neutralis* for Rifle Gap, Meeker, Buford, etc., based upon Oberholser's identification, may be noted here. The omission of the eastern form of Robin will doubtless be a surprise to many.

Among Felger's published records for northwestern Colorado which might have been added to the list with advantage are the following: Snowy Egret in White River Valley; Sandhill Crane nesting at Buford, etc.; Virginia Rail at Meeker (Selater says he has "not heard of it on the western slopes"); Sora at Meeker; Western Solitary Sandpiper, three August records for White River Valley; Upland Plover, Marvine Lodge, August 28; Short-eared Owl at Axial in August (Selater considers it almost altogether a winter bird in Colorado); Road Runner near Meeker, credited to Mr. Ball (Selater gives Denver as the northernmost record); White-throated Swift nesting near Axial; Bobolink, young birds near Meeker in August, indicating a nesting record; Purple Martin in Lost Park, September 1; Canyon Wren at Axial, one of the most northerly records of the species.

Bragg's summer record of the Gray-headed Junco at Boulder, altitude 5,700 feet, July 4, 1904, should be added to the list, as it indicates a probable breeding record much below the usual elevation. The Snowy Egret being rare, it may be well to add the record of two taken near Boulder in

1908, one of which is in the University cabinet.¹ The same collection includes a Black-throated Blue Warbler, taken in Boulder Canyon, at 8,000 feet, Oct. 16, 1911.

The bringing together of these records, even with Cooke's bulletins as a basis, and the preparation of new descriptions and keys, has been a great undertaking, but the work has been well done and deserves the appreciation of ornithologists, both professional and amateur.

JUNIUS HENDERSON.

University of Colorado.

Life of Sir William Jardine.

THE EDITOR OF 'THE AUK,'

Dear Sir:—For some time past I have been engaged in writing the "Life of Sir William Jardine," the naturalist.

I wonder if you would be so good as to insert this letter in your magazine, in the hope that, if it caught the eye of any one who might be able to assist me, either by letters from Sir William Jardine, or from personal acquaintance, they might communicate with me.

Yours truly,

HUGH S. GLADSTONE.

Capenoch, Thornhill,
Dumfriesshire, England.

March 12, 1912.

¹ Colorado College, an excellent denominational institution at Colorado Springs is frequently confused with the University of Colorado, a state institution located at Boulder. References to the collections and records of both institutions occur in Mr. Scialer's book.—J. H.

NOTES AND NEWS.

ONLY those who have had occasion to pursue their studies in the Ornithological rooms of the United States National Museum have realized what an enormous work Dr. Charles W. Richmond has accomplished in his spare moments during the past fifteen years, in preparing a card catalogue of the described species of birds. The student of North American birds with numerous comprehensive works and the A. O. U. Check-List at his elbow, has no conception of the difficulties that confront one who is studying the birds of South America, the East Indies, or Africa. Even with the literature accessible,—and there are few libraries in America that approach completeness, there are numerous questions of date of publication, first place of publication etc., which require much expenditure of valuable time for their solution and which are being worked out over and over again by different individuals, not always, unfortunately, with uniform results. Dr. Richmond's cards contain the actual date of publication, the original reference and spelling, type locality and location of the type specimen when indicated, all verified by his personal investigations. The periodicals and single volumes have been studied page by page and many new names proposed years ago and hitherto overlooked have been brought to light.

Some 30,000 cards have been completed, together with about 10,000 additional cards containing fragmentary data supplementing earlier cards or referring to those not yet prepared. Dr. Richmond estimates that the catalogue is at least three-fifths completed.

From what has already been said the value of such a list, prepared as it is by a skilled ornithologist, and the amount of time that the student saves who has access to it, can perhaps be appreciated. The labor involved in its preparation probably no one but its author will ever appreciate!

With the completion of his task practically assured Dr. Richmond has in mind the possibility of having all the future cards printed in duplicate or rather in a limited number of sets according to the demand that there might be for them and at the same time to reprint those already completed, beginning with the rarer and less accessible publications, so that such institutions as cared to coöperate with him would in a few years possess a complete card catalogue of the described species of birds of the world.

The benefit that such an unselfish undertaking would prove to the ornithology of the future can hardly be estimated, and should Dr. Richmond seriously consider the project he should receive every assistance and support.

AS TO BIRD BANDING.

Berlin, Md.,
January 20th, 1912.

"The Auk,
New York City.

Gentlemen:—

One of my men has just come in from a country mill and tells me that he has killed a bird, the species of which he did not know or else would not tell me, with a leg band on it, which he brought to me. Same bears the number 6302.

Would you mind letting me know the species and particulars of this matter, using the enclosed stamped envelope?

Thanking you in advance for the courtesy of your reply, I beg to remain,

Yours very truly,

(Signed) CHAS. W. TINGLE."

The above communication established an exceedingly interesting bird banding record. On consulting card No. 6302 the following memoranda were found: "Species—*Sialia sialis*; Locality—Meriden, N. H.; Date—June 3, 1911; Banded by—Ernest Harold Baynes; Approximate age of bird—About two weeks. Remarks—Band placed on left leg. The bird was one of a family in an unpainted wooden box on the corner of an old shed. Five young in nest."

This, to be sure, is only an isolated record, but from it we learn that a young bluebird reared at Meriden, N. H., in June, 1911, was wintering at Berlin, Md., or at any rate was there on Jan. 20, 1912, and it has since been ascertained that the bird shot was one of a flock of several. In addition to getting a banding record, therefore, we obtain a sidelight on the manner in which bird life is being destroyed in certain sections of the country.

When the Linnæan Society of New York first undertook some months ago to push the work of the American Bird Banding Association, and the members of the Bird Banding Committee inaugurated a campaign to raise funds for that purpose, unexpected obstacles were met with. Letters of protest were received from some, setting forth the cruelties involved in such a practice as bird banding; while many refused to contribute because the Association had not yet shown sufficient results—forgetting that any project in its infancy must be nursed for a time on faith until a start can be made. Let it be understood that those striving to carry on the bird banding work are not desirous of opposing or antagonizing anyone. On the other hand they invite suggestions and sane criticisms from everyone. If the banding of any particular species, for instance, is discovered for any reason whatsoever to be detrimental, members of the association will be instructed to pass birds of that species by. One gentlemen has even been so far-sighted as to suggest that the bands on birds' legs might attract the

attention of gunners, who would shoot the creatures to satisfy curiosity. But most birds carry their tarsi well buried in the body feathers while flying and it is gratifying to know that of all the return records thus far received none have resulted from the band being seen while the bird was still at large. The discovery of the band has in each case been purely accidental and has taken place after the bird was collected and in the hand.

It may be of interest to some to learn that during the summer of 1910 Mr. H. F. Witherby of London, England, issued to his staff of bird banders over 12,000 bands, and of these over 7900 were actually placed on birds. Two of his workers banded over 2300 birds (representing 16 species) and including 1200 Black-headed gulls, 600 Common terns, 157 Swallows and 105 Lesser Black-backed gulls. Europeans, in fact, are, at present, far ahead of us in this matter of investigating the movements of birds by the aid of metal rings. Bird banding activities are being carried on not alone by Witherby & Co. of London, but by "Country Life" of the same place, the University of Aberdeen, Scotland, and at the following places on the Continent — Rossiten, Denmark; Leyden, Holland; Budapest, Hungary; and possibly elsewhere. If the thousands of bands used by these investigators each year impeded or inconvenienced the birds to any extent or caused many to die it would seem that some evidence in support of this fact would long ago have come to light. Nor must it be thought that only the larger birds in Europe have been banded, for during a single season in England alone over 3000 tits and other birds no larger than some of our warblers were tagged. It might not be untimely, therefore, if Americans were to divest themselves of the delusion that bird banding is fanciful and unpractical if not cruel and barbaric.

The American Bird Banding Association has succeeded in gathering enough funds to push ahead with the manufacturing for use during the coming season of a fair number of bands which are now being made. These bands may not come from the factory for several weeks, but should be ready for distribution well before the nestlings of everything but great horned owls are old enough to receive them. Members of the Association will receive notice when bands are available and then it will remain to be seen what the season of 1912 will bring forth.

HOWARD H. CLEAVES, *Secy-Treas.*,
Public Museum,
New Brighton, N. Y.

ON February 27, 1912, the American Museum of Natural History opened for public view another of the notable habitat groups for which its ornithological gallery is famous. This represents the birds of tropical eastern Mexico, and illustrates the influence of altitude on the distribution of life. The group includes such birds as the Amazon Parrot, Parakeet, Toucan, Motmot, Trogon, tropical Tanagers, Cuckoos, Orioles, etc., which are found in the dense tropical forest about the base of Mt. Orizaba while

the snow capped mountain itself represented in the background shows the temperate and boreal zones that one traverses in ascending to its peak (18,225 feet); the same transition that would be experienced in a journey of 3000 miles northward at sea level.

The group was prepared under the direction of Mr. Frank M. Chapman, Curator of Birds, from field studies made by him on the American Museum expedition of March and April, 1910. The background is by Robert Bruce Horsfall from studies by Henry A. Ferguson and Louis Agassiz Fuertes, the accessories were prepared by William Peters and the birds by Henry C. Raven.

THE Academy of Natural Sciences of Philadelphia celebrated the one hundredth anniversary of its founding on March 21, 1912. The Academy has always held a foremost place in the development of ornithology in America. Among the men who in 1812 conceived the idea of organizing the society there was one, Thomas Say, who figured as an ornithologist, although more prominent in other branches of science; while among the first members elected was Alexander Wilson whose untimely death occurred before he had qualified for membership.

In the years that followed the Academy numbered among its active members Charles Lucien Bonaparte, George Ord, Thomas Nuttall, Thomas B. Wilson, John Cassin, Edward Harris, William Gambel, Adolphus L. Heerman, John K. Townsend, Samuel W. Woodhouse, while among its correspondents were Audubon, Baird, Lawrence, Coues, Xantus, etc.

For many years the Journal and Proceedings which now comprise eighty-four volumes formed the principal vehicle for ornithological publication in America and especially during the active period of Cassin's career became famous among ornithologists the world over.

The great ornithological collection of the Academy which now comprises some 60,000 specimens first gained prominence through the munificence of Dr. Thomas B. Wilson at one time president of the society who purchased the Rivoli, Gould, Boucier and other foreign collections as well as all the North American material that could be secured and by 1857 had established the Academy's collection as the greatest in the world, in the opinion of no less an authority than Dr. P. L. Selater.

With the exception of the American Philosophical Society which celebrated its centenary a few years ago, and perhaps a few others, the Philadelphia Academy is the oldest scientific society in America and probably the oldest of those devoted purely to the natural sciences. Its completion of one hundred years of activity really marks the completion of the first century of serious investigations in natural history in this country. The record as we review it is one of which we can well be proud and in the development of science in America to the high standard that it has now attained, the Academy of Natural Sciences of Philadelphia has contributed not a little.

THE Cooper Ornithological Club has recently established two permanent committees for the conservation of wild life. The chief objects of the Club in doing this may be stated as follows. (1) To co-operate with other organizations, including the State Fish and Game Commissions and the Federal Bureau of Biological Survey, to the end that the wild life yet remaining in state and nation may be more effectively protected. (2) To work at all times for an enlightened public sentiment along lines of the conservation of wild animals.

Following is the personnel of the committees. For the Northern Division of the Club, W. P. Taylor, Museum Vertebrate Zoology, Berkeley, Chairman; H. C. Bryant, University of California; J. S. Hunter, State Fish and Game Commission, San Francisco; H. W. Carriger, San Francisco; and John W. Mailliard, San Francisco. For the Southern Division, Frank S. Daggett, Director Museum of Science, Arts and History, Los Angeles, Chairman; J. Eugene Law, Hollywood; H. J. Lelande, Los Angeles; Howard Robertson, Los Angeles; and G. Willett, Los Angeles.

MESSRS. W. H. Osgood and Malcolm P. Anderson sailed from New Orleans January 27, 1912, for Colon *en route* for northern Peru where they will cross the Andes into extreme western Brazil. Their object is to collect birds and mammals for the Field Museum of Natural History, but their exact itinerary and time of return will depend upon the conditions that they encounter.

THE Delaware Valley Ornithological Club held its regular annual meeting at the Academy of Natural Sciences of Philadelphia on January 4, 1912.

The officers elected for the current year are President, Samuel N. Rhoads; Vice-President, Stewardson Brown; Secretary, J. Fletcher Street; Treasurer, Samuel C. Palmer, Editor of *Cassinia*, Robert Thomas Moore.

The Club held fifteen meetings during the year, some of the more important communications being A Trip across Canada, by Wm. E. Roberts; Some Western Birds and their Home Lands, by J. A. G. Rehn; Bird-life about Tampa, Florida, by Robert T. Moore; Birds of Northern Venezuela, by Stewardson Brown; Life in the Heron Rookeries of Central Florida, by O. E. Baynard; Birds of the Tierra Caliente of Ecuador, by S. N. Rhoads; Some Birds of St. Margaret's Bay, N. S., by Dr. Spencer Trotter.

THE Journal of the Maine Ornithological Society announces its discontinuance with the December 1911 number, completing its thirteenth volume. We are glad to learn however that this action does not involve the dissolution of the society. It has done excellent work in the interest of bird study and bird protection and we trust that its activities may continue.

"THE GAME-BIRDS OF SOUTH AFRICA" is the title of an important work which Messrs. Witherby & Co. are about to publish. The book is by

Major Boyd Horsbrugh, and will be illustrated by nearly seventy colored plates reproduced in facsimile from the very remarkable drawings of Sergeant C. G. Davies. The work will be in small quarto, and will be issued in four quarterly parts.

The same firm have in preparation and are shortly publishing for Mr. F. W. Headley an illustrated book on the *FLIGHT OF BIRDS*, a subject which the author has long studied. The book is designed to interest the aviator as well as the ornithologist.

AN Ornithology of Porto Rico is announced by José J. Monclova y Cagigal, to be written in Spanish, French and English.

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BIRD GENEALOGY.¹

BY CHARLES W. TOWNSEND, M. D.

ARCHÆOPTERYX had teeth in its jaws, separate hip bones, bi-concave vertebræ, claws on its front limbs and a vertebrated tail, all marks of the reptile, in which group it might still be placed by some, were it not for the fact that the impression of the feathers has been preserved to us and stamps its essential bird nature. The links between birds and their reptilian predecessors are very perfect.

Now if birds are descended from reptiles, one may perhaps still find some traces of this lowly origin in the infantile period of bird life, just as there are various ear-marks of the savage of the jungle in the infancy of the most gilded city dweller, not to mention the transient and permanent reversions often found among adults of the race. Thus the Hoatzin of the Orinoco when young, has claws on the wings and scrambles about the branches in a truly reptilian style, a mode of progression that, according to Beebe, is still used by the adults.

One need not go so far as the Orinoco, however, to find evidences of the quadrupedal reptilian mode of progression in birds, as witness the actions of young Herons before they learn to fly, when with wings and legs they climb about their family tree almost as gracefully, I dare say, as did some of the ancient winged reptiles.

¹ Read before the Nuttall Ornithological Club, March 4, 1912.

The extension of the so-called thumb or bastard wing in the Pigeon and other birds as they approach their perch may in the same way hark back to the time when the reptilian ancestor grasped with its fore feet its goal on the tree tops. Both young Green and Night Herons elevate the bastard wing at times as they climb about the trees, but I have never seen them attempt to use it for grasping.

Left with a couple of young English Sparrows on my hands owing to the destruction of their nest caused by the closing of a blind, I dropped them into a basin of tepid water, expecting the inert masses to sink or at least that their wabby heads would fall below the surface. On the contrary they became endowed with life and vigor as if upon their native heath, and, with a combination of rapid wing strokes and leg action, and with necks outstretched they scudded across the surface of the miniature pond.

Blood will out, the reptilian ancestry was working! To make sure that this was not an accident I dropped a young Red-winged Blackbird into the pool below his nest. He too performed in exactly the same manner and safely reached some reeds up which he scrambled, and was there well taken care of by his excited parents. It is probable that many a passerine bird nesting over the water has been saved from destruction by this return to primitive methods.

Further experimentation with young Crows and Bronzed Grackles showed me that very young birds generally moved the wings alternately, while older ones always flapped both together as in flight. From this one would infer that the primitive reptilian scramble was naturally an alternate method while the simultaneous method was simply the more advanced style used in flight.

In the case of the Chimney Swift the method of flight has been thought to be an alternate flapping of the wings. Let anyone watch these curious birds as they dart with amazing speed through the air, and I am sure he will agree that the wings are used alternately with great rapidity. Steady flight by this method is, I believe, mechanically possible. One might argue therefore that the Swifts retain the more primitive or reptilian method of moving the front limbs and are therefore members of a very early branch on the avian tree, although it is possible that through extreme specialization they have returned to this form of flight.

If this prone method of propulsion on the water on all fours is a

primitive one, as indeed it must be, then birds that swim in an erect Duck-like manner must have advanced beyond this stage and become specialized. I have several times seen young Spotted Sandpipers that were unable to fly, swim with ease like little Ducks, although when very young and much frightened they return to the primitive reptilian scramble on all fours. All of the members of the Shore Bird family swim naturally if they find themselves in water beyond their depths. Phalaropes habitually disport themselves on the surface of the water as gracefully as miniature Swans. It would seem to be a natural inference, therefore, that the ancestors of Shore Birds were swimmers and that the art of swimming is inherited and not developed by this group, and that the Phalarope is a case of reversion. The awkward action of a young seal at its first bath is an example of a case where the art of swimming has been recently acquired by a group and where it is not one of long inheritance.

In the classification of birds proposed by Hans Gadow the order *Charadriiformes*, or Plover-like birds, includes the Shore Birds, Gulls, Auks and Pigeons. The Shore Birds, we have just seen, show evidence of a swimming ancestry, although, with the exception of the Phalaropes, they habitually prefer the shore under their feet, even if it is wet and partly covered with water, to the deep sea. The presence of partial webs, as in the Willet and in the Semipalmated Plover and Sandpiper, point to the former existence of the swimming habit, for these birds like other Shore Birds do not swim except when unexpectedly forced to it.

If the partial web in the foot of the adult Shore Bird showed the beginning of the swimming habit in birds of land ancestry we should find the young birds like young seals very inexpert in the water. As the reverse of this is the case our conclusion that these birds are of water ancestry must be correct.

Gulls and Terns have fully webbed feet but their habits at the present day hardly justify them in this possession. Webbed feet are of great advantage to the rapidly swimming bird and to the diving bird that depends on its feet. Now Terns rarely rest on the water or swim and Gulls do not often swim rapidly, in fact they rarely swim at all, but drift about, while if either bird descends below the surface, it is as a result of the velocity of its plunge from

the air, and its feet are probably not used. In fact the web, although useful, is largely wasted on these birds, and it is evident that it is ancient and points to a swimming ancestry. That this ancestry is less remote than in the Shore Birds is perhaps shown by the fact that a wing-tipped Gull, falling on the beach will take to the water, and swim vigorously out to sea, while a similarly crippled Shore Bird falling into the water will swim to the beach and endeavor to run inland to hide.

Before they are able to fly, young Skimmers are said to seek safety by running into the water, another evidence of their water ancestry. Chapman in his "Camps and Cruises of an Ornithologist," speaking of young Common Terns a few days old, says: "several were seen to enter an inflowing creek, drink repeatedly of the salt water and swim actively, in evident enjoyment of their natatorial powers, while the parents, who rarely alight on the water, watched them from the shore. Possibly here was an explanation of the value to Terns of webbed toes. Functionless in the adult they are of service to the young, before the power of flight is acquired." In this supposition he is probably right, although this service to the young is not the reason for the existence of the webs, but the observation points very clearly to the swimming ancestry of the birds. We could not have stronger proof of it.

That the Auks are out and out water birds there needs no defence, but one is at first sight puzzled by the presence of the Pigeons in this group. The older systematists placed the Pigeons with the Partridge and Domestic Fowl tribe, but Pigeons may be seen wading in puddles in a manner that would alarm the Barnyard Cock. I have been told by a Pigeon fancier that young Pigeons are much attracted by water, and fond of bathing therein, and that young birds are liable to drown themselves in tanks or troughs if these are accessible to Pigeon lofts. I recently placed a half-grown Domestic Pigeon in a wash-tub of tepid water. With head and neck erect, the bird swam rapidly with alternate strokes of the feet to the side of the tub. The wings were arched up and waved slightly,—not stretched out and flapped in the water as in the case of young Passerine birds. Its position was like that of a Duck but low in the water. Progress was much more rapid than on land where the bird stumbled awkwardly along. Indeed it had

never before left the nest. I repeated the experiment several times with the same result. A fact of considerable interest in this connection is that "A Pigeon with a perfectly webbed foot [was] evolved at Cambridge by only three years' selected crossings."¹ This may be looked upon as a case of reversion. The throwing of somersaults in the air similar to those of the Tumbler Pigeon has been reported in the case of the Black-bellied Plover.

The Sheathbill, *Chionis*, is so ancestral and generalized in its type that it suggests all the groups we have just been considering. Anatomically it is allied to the Oyster-catchers and the Gulls. It is often classed among the Plovers, but it is as marine in its haunts as are the Auks, and in flight it resembles the Gulls. Its appearance on land, gait and manner of courting are very much like those of a Pigeon, and it goes by the name of 'Kelp Pigeon.'

While young Terns take to the water, young Cormorants when pursued take to the shore. This would suggest a terrestrial ancestry of these birds, and according to Gadow, Cormorants strikingly resemble the New World Vultures, and the habit of both these birds of sitting with their wings spread is suggestive of kinship. The fact that Cormorants on rising into the air hop with the feet together, although their usual gait is a waddle, suggests a former arboreal life, and many Cormorants still nest in trees.

Tree dwellers naturally hop from branch to branch, and it is probable that the earliest birds were arboreal. When the tree-dwelling bird descends to the ground it naturally hops there also, but hopping is not a satisfactory method of progression for a ground-feeder, — it does not permit of cautious approach, and it is decidedly jarring. A walking gait, therefore, may be understood to indicate a long custom of feeding or dwelling on the ground. Although the Flicker is frequently seen on the ground, the ground habit is probably but recently acquired, for it has not learned to walk, while the Robin for example is able to run, and does so much more often than it hops. Young Robins show, however, their arboreal ancestry by hopping more than they run. Pipits, Horned Larks and Ipswich Sparrows have so completely departed from arboreal habits, that they run easily and walk with grace. Walking

¹ T. Digby Pigott. "London Birds and other Sketches". London, 1902, p. 239.

appears to be acquired later than running. It is a very interesting fact that the Savannah Sparrow, frequenter of meadows and marshy pastures, generally hops even when on smooth ground, although it is also a good runner, while its near relation the Ipswich Sparrow, frequenter of sandy wastes, almost never hops and is a good walker.

Heron as far as I know, although constantly in the water very rarely swim, but that they come of a swimming ancestry seems probable from the behavior of a young Green Heron not old enough to fly that I put in the water. It sat erect on the surface and swam off with a grace and ease that contrasted forcibly with its awkward movements on land. Not only was its poise graceful and Swan-like, but the speed with which it swam, the practiced manner in which it feathered its ungainly toes, the ease with which it threaded its way among the grass stalks, and dabbled every now and then at the water with its bill, all pointed to an inherited instinct, an instinct, however, that is largely if not entirely lost in adult life. This young Heron had never practiced the art of swimming before — it had probably never left the nesting tree, which was on a marsh island some distance from even the highest tides. Adult Herons like some Shore Birds show their swimming ancestry by a distinct web between the middle and outer toes.

The use of the wings under water in some diving birds and the significance of this fact I have already discussed in another place.¹

One is apt to think of evolution as a thing of the past, an accomplished fact, and to forget that at the present period of time this great law is still as existent as it has been since the world began. With change in environment, there comes through natural selection acting on slight variations and occasional mutations a change in the structure to fit the new environment, and in time a new species is developed. As new species arose in the past, so they must be in various stages of formation at the present time. The great group of American Warblers are for the most part slender-billed, insect-eating birds, that go south with the approach of cold weather. One of them, however, is enabled to spend the winter on the bleak New England coast by a change from an insectiv-

¹ Auk, XXVI, 1909, pp. 234 to 248.

orous to a seed-eating habit. The Myrtle Warbler thrives through the cold winters chiefly on a diet of bayberries, while all the other members of this family seek more genial climes, where they may continue to live on insects. Not only this, but a large number of its own species go south, and winter in the Greater Antilles, Mexico and Panama, where insect food is of course abundant. The New England birds eat not only bayberries, but also the seeds of grass and weeds that extend above the snow, and they glean the bark of trees like Titmice.

Now birds like men are clannish; in fact there is a remarkable similarity between animal and human nature,— which is not so surprising when one considers our origin and relationships. Among savages slight differences due to different environment, set apart one group or race from another. Each race considers itself *the* people, and despises, fights and refuses to mix with the other. The Eskimo and the Indian, although both manifestly of Eastern origin, so dislike each other that intermarriage, except under the influence of civilization, is rare. This tendency makes of course for differentiation; without this tendency the constant mixture of races would make the production of new species more difficult. While this clannishness is most marked among savages, it is also so pronounced in civilized races that each nation classes all foreigners, especially those that speak a different tongue, as their inferiors with whom intermarriage is not to be thought of. The more ignorant the individuals, that is to say the more primitive or animal-like, the more intense is this clannishness, and, its boundaries may be limited, not by the nation or state, but even by the village in which the individuals live. Mr. Punch's collier who proposed ' 'eaving 'alf a brick' at the stranger in town is an instance in point.

The element of home also enters into this exclusiveness which favors the formation of races, and hence of new species. This factor is strongly shown in the human species unless the individual has become cosmopolitan by travel and education; and the inhabitants of what appears to an outsider to be a most desolate region regard their home as superior to any other country on the globe, and pine if taken away from it.

Now the seed-eating Myrtle Warbler that spends its winters in the cold and stormy north is undoubtedly as clannish as the

Eskimo, and considers itself superior to the south-seeking Myrtle Warbler, and it would probably pine for its northern home if transplanted by force with the rest of the species to tropical regions. In addition, its clannishness probably impels it to chose a summer home apart from its southern relations.

At present man cannot distinguish the northern from the southern Myrtle Warbler, just as in the remote past, it is probable that the Eskimo could not be distinguished from the Indian. In time, however, aided by this inherent clannishness and love of home, one might predict that a larger race of northern Myrtle Warblers would be formed with thicker, stronger bills and more muscular gizzards. Indeed I have endeavored to investigate these three points in order to discover whether a beginning had been made in the evolution of this new species, but I have not as yet examined enough material to throw any light on the subject.

One can easily see how important the element of clannishness is, for without it interbreeding might for a long time, if not indefinitely delay the birth of a new species. The importance of clannishness in the evolution of races and species, has I believe never been given due weight.

As among men so among birds there are striking differences in ambition and ability to succeed. Some men, some families, some nations are progressive,— they are always reaching out for new opportunities and taking advantage of them. Others are retiring, unambitious and contented to remain where they are. One of the most remarkably progressive birds is the Horned Lark which has spread to nearly every part of the continent, and has made each part so much its home that it has adapted itself to the environment to the extent of changing its own form and plumage. There are now recognized fourteen different North American races or subspecies of the Horned Lark. The pushing character of the bird is shown in the recent extension of the breeding range of the Prairie Horned Lark from the central part of the continent to New England. In 1889 it was first recorded as breeding in Vermont, and the same year in central Massachusetts. In 1903 it reached the sea and bred at Ipswich and has come there to raise its young ever since, meanwhile increasing in numbers throughout the New England states.¹

¹ Auk, XXI, 1904, p. 81.

The Song Sparrow has adapted itself in twenty different forms to all parts of the continent, and is abundant almost everywhere. Incidentally it is interesting to compare a map of North America showing the various lingual races of Indians with one showing the various races of Song Sparrows. Both maps show an extensive race in the more uniform east — the Algonquin Indians, and the *melodia* sparrow,— while both show in the diversified surface of the extreme West numerous races of both man and bird.

What a contrast is the enterprise shown by the Song Sparrow to the lack of enterprise in the case of such a bird as the Swamp Sparrow, for instance. Although first cousin to the Song Sparrow and although it is spread over a large territory, the Swamp Sparrow limits itself to the almost uniform environment of swamps, and has therefore never developed any races.

Another bird which is showing great developmental or evolutionary possibilities is the Grackle both Purple and Bronzed. This bird instead of shunning man has been bright enough to appreciate the fact that it is safest from persecution when in most intimate relations with him. It has come into his towns and cities, and it does not hesitate to build its nests on his houses. In Boston, although there had been a few previous records, it was not until 1900 that the Bronzed Grackle began to breed regularly in the Public Garden, and the numbers increased so that thirty-two nests were counted there by Mr. H. W. Wright in 1906. In 1907 they first began to build nests in the vines on my Ipswich house, and two pair have nested there every summer since, when I permitted. In the matter of food they are not particular, or rather their appetite is a catholic one, and they can adapt themselves to circumstances. They are able to pick eggs out of a Robin's nest and peas from pods in the garden, and they undoubtedly serve a useful purpose in towns and cities by diminishing the English Sparrow nuisance. I have seen one hold down a struggling English Sparrow with its foot while it deliberately pecked out its brains. While the English Sparrows follow Robins hunting worms on the lawn, and saucily snatch the worm away from their very mouths, they keep at a safe distance from the Grackle, and if he so much as stops to look at them, they fly off in terror. In fact Grackles put to flight the innocent Robins. I have seen a Grackle partly run

and partly hop with wings extended toward a Robin that was digging worms near by, making the Robin desert the spot on which the Grackle then dug.

But the most interesting development of the Grackle, one that shows its great adaptability and intelligence, is a habit it has of picking up food from the water, after the manner of the Herring Gull. A Grackle will hover close to the water its head to the wind, and then suddenly drop, and with its bill pick up from the surface some morsel as gracefully as a Gull. This they do at times without wetting their plumage; at other times the bill, feet and tail are immersed, while I once saw a Grackle splash his whole body into the water and entirely immerse his head, to emerge without difficulty, carrying in his bill what appeared to be a small silvery fish. I have seen them after sailing and hovering over the water in a high wind with the spray dashing about them, skilfully pick up food from the tops of the waves.

It is easy to picture an island community of Grackles becoming more and more addicted to a maritime life, owing perhaps to the shrinking of their terrestrial food supply due to a change of climate or to land subsidence. Would not these habits become in time as much inherited as are similar habits in the Gulls? Or, to put the question in another way, were not the inherited traits of the Gulls originally acquired?

The Ipswich Sparrow is the only strictly dune dweller among the birds. Its summer home is on Sable Island, an island of sand dunes off Nova Scotia, and it spends its winters along the sandy portions of the Atlantic coast. It is evidently a near relation of the Savannah Sparrow, which is somewhat smaller and darker, and lives chiefly in marshes and open fields from Labrador to New Jersey. As the glaciers receded we can picture the gradual pushing north of the Savannah Sparrows, and their extension to the great sandy wastes that fringed the coast for miles. As the land sank and the waters rose restricting these regions of sand, the struggle for life among the clan that preferred the sand dunes must have been an intense one, and it is probable that the larger and stronger birds, as well as those that more nearly matched in color their surroundings were the more likely to survive. Isolation from the main land finally aided in the work, and at last a distinctly new species

was evolved, a bird larger than the Savannah Sparrow of the main land, and of a gray or sandy, rather than a black and brown color, so that when it squatted in terror on the sand the sailing Hawk was more apt to pass it by.

It seems to me, therefore, that the evolution of the Ipswich Sparrow is comparatively recent, and that the age of this species may be counted by the paltry fifty thousand years or so that have elapsed since the last glacial period.

A RECONSIDERATION OF THE AMERICAN BLACK DUCKS WITH SPECIAL REFERENCE TO CERTAIN VARIATIONS.

BY JOHN C. PHILLIPS.

THERE are several species of primitive ducks which for many reasons are of peculiar interest, on account of their remarkable geographical distribution and mutual interrelationship. This group of species is composed of *Anas fulvigula*, *Anas tristis*, *Anas diazi*, *Anas wyvilliana* and *Anas laysanensis*. Most of these are poorly represented in collections and this fact has led to certain misconceptions. It is the purpose of the following notes to point out some of these mistakes, and to say a few words about individual and sexual variation.

To begin with I wish to call attention to the principal difficulty in the proper understanding of these local races; this is the presence of a sexual difference in plumage, increasing probably with age, and comparable, with that of the Hawaiian duck (*Anas wyvilliana*). In this way all these related species can be separated from *A. tristis* in which the sexes are similar. At first I thought that this sex difference was confined to *A. diazi* and I started to limit these notes to the latter species, but as more specimens turned up I thought it better to consider all the American Black Ducks.

In the autumn of 1910 Mr. W. W. Brown, Jr., collected some birds for me in the lake region near Mexico City. In the collection was a large series of *Anas diazi*, heretofore very rare in museums. There were six males and seventeen females, taken near Lerma in the early Fall.

Upon examining this series I was struck at once with the very marked sexual difference shown in the skins, a difference which does not appear to have been properly noticed. The species was first described (Ridgway, Auk, 1886, p. 332) from an immature female and then later by F. Ferrari-Perez (Pr. U. S. Nat. Mus., 1886, p. 127) from an adult male, as well as an immature female. In the latter paper the female was said to be very similar to the male except that the streaks of the lower parts were narrower. The sexual color differences of bills and legs were not noted.

It is at once apparent that this bird is widely different from the other American Black Ducks.

Sexual dimorphism. The most noteworthy sexual differences are as follows. The male is somewhat larger than the female, more especially in the wing measurement. The upper mandible of the male is colored a dull olive or yellow-olive, while that of the female is dusky along the center and brilliant orange on the sides. Conversely the feet and legs of the male are bright orange and those of the female a dull orange color. The under parts of the males are barred with irregular blackish V-shaped markings, while the females are all more or less finely streaked with a lighter dusky shade. This difference of appearance is due to a different feather pattern, particularly on the front and sides of the breast. (See plate.) The typical female feather has a dark central wedge at the tip, while the male feather is edged with brown and patterned with a V-shaped sub-terminal black area.

Individual variation. Both the anterior and posterior ends of the speculum are framed by a black band inside, and a light band outside. The posterior white band, formed by the tips of the outer secondaries is fairly uniform, but the anterior white band is very variable. In some cases it is narrower and mixed with buff or dusky; and in three cases it is absent altogether and replaced by a very faint dusky line. These last are all females. We see thus a tendency to vary in the same direction as will be pointed out

further on for *A. wyvilliana* and along the lines of what appears to be a distinctly Mallard character. In one specimen, Mus. Comp. Zoöl., No. 54135, the fifth secondary from the outside shows no metallic color. Its inner web is normal, while its outer is brown, dusky at the shaft, and light buff on the edge.

Taken as a whole this series appears very uniform in color and does not present the variety of appearances which is seen in *A. tristis*. In the latter the tips of the secondaries very often show a narrow white band, and occasionally a specimen is found that shows a white or whitish band at each end of the speculum, thus approaching the Mallard type.

The speculum color of *A. diazi* varies, as it does also in *A. platyrhynchos* and in *A. tristis*, from a metallic violaceous green to a violaceous purple. This difference has apparently nothing to do with age or sex and is not a character of specific importance, except within wide bounds. It seems to have been used too frequently in describing specific differences.

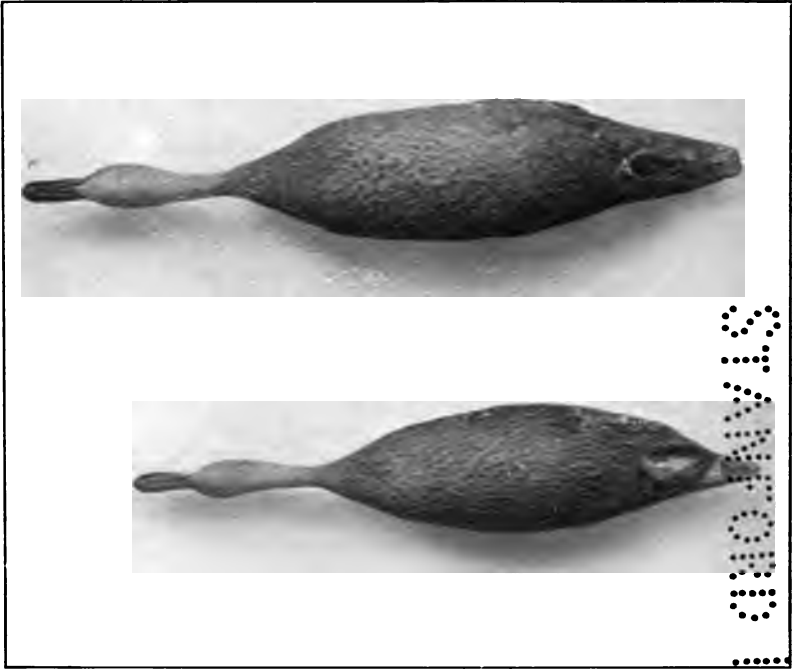
ANAS FULVIGULA — FLORIDA DUCK AND A. F. MACULOSA —
MOTTLED OR TEXAN DUCK.

As originally described by Sennett (Auk, 1889, p. 263) the Texan form was separated from the true Florida Duck on the basis of several indefinite characters, which I should like to consider briefly. It is certainly a fact of peculiar interest if two races of Ducks could be found within such an area as the southeastern states where except for a very few exceptional cases the avifauna is so uniform.

In the British Museum Catalogue, Vol. XXVII, p. 203, Salvadori says, "In my opinion *A. maculosa* is scarcely different from *A. fulvigula*."

I have at hand a fine series of *A. maculosa*. There are 3 from the Museum of Comparative Zoölogy, 5 from the collection of Mr. John E. Thayer and 4 from the collection of Mr. Wm. Brewster. These have been carefully compared with a series of 7 Florida Ducks in the Museum of Comparative Zoölogy and 13 from Mr. Brewster's collection. I do not hesitate to say that as far as I can see there is no racial difference between these 12 specimens from

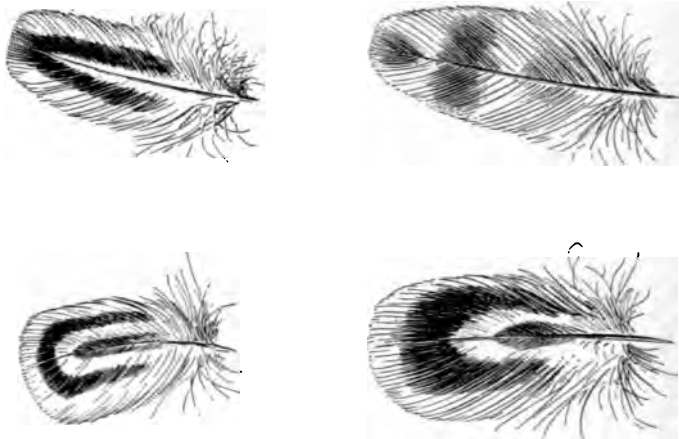
Texas and the 20 from Florida. There is also one Florida Duck in down in the Brewster series. In the original description of *A. fulvigula* (Ridgway, Pr. U. S. Nat. Mus., Vol. I, p. 251) nothing is said about sex dimorphism, yet this is apparent though perhaps not quite so uniform or so well marked as in *A. diazi*. Mr. Brewster's specimens are especially fine, being mostly birds in fresh plumage. There is a general tendency to a more mottled appearance in the males and a more streaked appearance in the females; the difference being particularly marked over the breast, where the males average very much darker. The different appearance of the under parts is due to a feather pattern similar in general to that found in *A. diazi* and *A. wyvilliana*. The typical male breast feather has a V-shaped black pattern tipped with brown, in unworn specimens, while the female has a more irregular black pattern extending to the tip as a median wedge-shaped area. The sexual difference is probably accentuated with age, and there is no trouble in picking out the adults of either sex at a glance. There is good evidence both here and in *A. diazi* that the immature feathers are of the female type, the typical male pattern first appearing on the upper chest, and later extending to the abdomen. Except in one case the dry bills of the Brewster series are all dull orange in the female and dark olive in the male. This one exception is a black bill in an undoubted female specimen. There is no tendency in any of the males to sex feathers in the tail. The speculum varies from a brilliant green to a brilliant purple. There is no trace of an anterior white speculum band, but a posterior white one often occurs. The chin color varies from cream white to pale rufous and no specimen shows a rufous chin. The male birds are somewhat darker throughout than are the females. The young in down (one specimen), has a distinctly pale appearance compared with the young of *A. tristis*. It is brownish in appearance rather than dusky. Bearing these facts in mind and turning now to *A. fulvigula maculosa* we find this Texan and Mexican race separated from the Florida race by Sennett with the following characters. Color of the cheeks more brown than in *A. fulvigula* (streaked with brown according to Sennett, but I cannot see what is meant by this). It is probable that the Texan birds were thought to have more richly colored chins. The speculum is said to be purple instead



Female on left.

Male on right.

ANAS DIAZI.



BREAST FEATHERS, ENLARGED.

ANAS WYVILLIANA (above).

ANAS DIAZI (below).

Male on left.

Female on right.

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of green, while the general color of the under parts is mottled instead of streaked. The light color of the margins of the tail feathers is said to be different, as are the lighter parts of the plumage in general.

As to the color of the cheeks there is no difference in the markings themselves, or in the ground color. It is true that in specimen No. 4562, M. C. Z., from Brownsville the ground color of the chin is rather darker than any Florida specimens which I have seen. The bird as a whole is very dark, having the appearance of being stained during life. As to the speculum color it varies so much, as was shown above that I cannot consider it very seriously. In Mr. Brewster's specimens from Texas the color was purplish green, and in the other specimens there was quite a range of shading from purplish green to a nearly pure purple. The direction of the light, must of course be taken into consideration in judging speculum colors. As to the general color of the under parts it would seem that an adult male Texan bird was being compared by Sennett with a female or immature male from Florida. The general color of the feather margins does not show any difference in the two regions. As to size, over 70 separate measurements have been carefully taken and averaged, and they show absolutely no difference. They do show this, however, that the Florida and Texas birds differ slightly from *A. diazi*. The culmen in *A. diazi* is shorter, while the tarsus and wing are slightly longer. A somewhat careful consideration, then, has given no proof of two races of *A. fulvigula*.

ANAS TRISTIS—BLACK DUCK.

It is not the purpose of this paper to discuss the question of two forms of this species.¹ Neither material nor experimental proof is at hand. It is, however, very interesting to look at a mixed series of *A. tristis* and compare it in a general way with *A. diazi* or *A. fulvigula*. In the former species there is a diversity in general shade and markings, especially on the lower parts, which is very curious in such stable birds as the Anatidæ. It suggests that we are dealing with a 'mixed population', the term being used here

¹ *A. rubripes* and *A. rubripes tristis*.

in a genetic sense. There is certainly evidence of two forms, but unfortunately some of the characters form a graded scale, and are well defined only in male birds, perhaps only in old males.

There are however, other interesting variations in *A. tristis*, such as the irregular occurrence of characters that are essentially Mallard. I mean here variations that occur outside of the rather common hybrids with the Mallard. Such variations occur in a large number of full plumaged male birds. I paid some attention to these variations a few years ago and was surprised to find in perhaps 20 to 30 per cent. of male birds taken in late fall in Massachusetts, some of the following abnormalities. One or more brilliant metallic green feathers on the pileum; a general metallic cast to the feathers of the upper parts, especially the rump; the upbending of the central tail feathers, sometimes to quite a marked extent; and the very much darker appearance of the chest in contrast to the abdomen, so that a demarcation line was more or less apparent, corresponding to the lower edge of the chestnut in the Mallard. Also, as was before noted the posterior end of the speculum may be banded with white, and occasionally both ends are framed by a narrow white band. These characters may appear singly or several of them in combination.

If they signified a slight infusion of Mallard blood we should certainly expect to find some sort of corresponding variation in the Mallard. Such, however, is not the case. Aside from well marked hybrids, the Mallard presents no evidence of contamination. We must, therefore, regard these variations as slight Mallard tendencies which are being carried along by the species, for the most part in a latent or inhibited condition.

In examining some pure wild male Black Ducks which I have had in captivity for three years I was much struck with the large amount of green which had appeared in the postocular stripe and along the sides of the pileum. Their rumps were brilliant bronze with iridescent green reflection. There has certainly been a change in these birds in three years, but I have no exact notes. I have never seen so much green in any wild killed Black Ducks as one of these captive ducks shows.

The occurrence of such variation makes the problem of a possible bi-racial composition of *A. tristis* even more difficult. I hope to

be able soon to obtain experimental proof either for or against the presence of latent Mallard characters in *A. tristis*.

ANAS WYVILLIANA — HAWAIIAN DUCK.

This duck is considered here because of its undoubted relationship to the American Black Ducks, and on account of its curious variations, which have already received comments from several writers. I hope to show that, as in the case of the Florida Duck, a certain amount of misconception has arisen because of a failure to understand the sex plumages. There are other matters, however, that cannot be disposed of so easily and which must be taken up in some detail. The U. S. National Museum has kindly loaned seven specimens of this very rare duck, and the three others studied belong to the Museum of Comparative Zoölogy. The species is now either extinct, or bordering closely upon it.

The Hawaiian duck is very interesting also, because it shows direct Mallard affinities, and is the only other species except the Laysan Teal (*Anas laysanensis*) that normally carries the Mallard sex feathers in the tail. Its individual variation is all the more curious when found in a group as stable as the Anatidæ, especially when confined to an insular habitat.

Anas wyvilliana was first described, with a short diagnosis, by Sclater in 1878 (P. Z. S. 1878, p. 250) but there was nothing to show to which sex the specimens belonged, except the mark of the collector, who recorded them as males. In the Voyage of the Challenger (Birds, Plate XXII) Sclater figures one of these males, which is apparently in juvenile plumage or perhaps in summer moult.

In 1888, Stejneger (Pr. U. S. Nat. Mus., Vol. II, p. 98) calls attention to the defects in the original description and in the plate, and then deals at some length with the various differences found among the five specimens then at hand in the U. S. Nat. Museum. Other remarks were made about this species by T. Salvadori (in the British Museum Catalogue, Vol. XXVII, p. 196, 1895) who also considered this bird more or less of an ornithological puzzle.

Rothschild in the 'Avifauna of Laysan,' 1900, p. 271, gives two plates of *A. wyvilliana* and discusses his large series of specimens.

First let us glance briefly at the ten specimens before us and in a general way give the main points of sexual difference. Of the six males, four are correctly sexed, one is unsexed, and one has been sexed both as a male and a female and then had both marks crossed out. There is, however, no question about the sex of either of these two. All six males present the characteristic V-shaped markings on the breast (see plate) thickly streaked throat and cheeks, nearly black pileum, sometimes mixed with iridescent green towards the neck; and except in one case evidence of sex feathers in the tail. In this one case (Nat. Mus. No. 113448) the middle tail feathers are lacking, probably moulted out as the date is May. The sex feathers appear to be typically three in number, but they may be four. They are not so well developed as in the Mallard.

Of the four females all are correctly sexed. They all have the streaked under parts characteristic of *A. diazi* (see plate), immaculate throats and absence of sex feathers.

The table of measurements below shows the size difference in the two sexes. This is small and about comparable with that seen in *A. diazi*.

Males.

	No. 113447						
	U. S. Nat.	113449	131717	113448	21319	15025	
	Mus.	do.	do.	do.	do.	M. C. Z.	Av.
Culmen	44	44	45	48	44	46	45
Wing	230	218	223	228	218	212	221
Tarsus	37	39	39	40	39	38	39

Females.

	<i>A. aberti</i>						
	Type 12788						
	U. S. Nat.	113450	131718	48384	48383		
	Mus.	do.	do.	M. C. Z.	M. C. Z.		Av.
Culmen	42	44	41	44	45		43
Wing	212	210	206	215	219		212
Tarsus	35	38	38	38	41		38

We must now turn to Dr. Stejneger's account of the species. He first describes the two males, U. S. N. M., No. 113447 and No. 113449, and shows several points of difference between them, especially in the color of the bill, in the anterior white wing band and in the under wing-coverts and under tail-coverts.

No. 113448 was taken to be a female (absence of sex feathers noted above) although the specimen is without doubt a male, as evidenced by the characteristic breast pattern, large size, and dark chin. The smaller upper wing-coverts are broadly margined with cinnamon in this specimen, a character also seen especially well in No. 131718 and in the type of *A. aberti*. This certainly looks, as Stejneger himself suggests, like a youthful type of plumage for the males of more advanced plumage show the small wing-coverts plain drab, slightly edged with white.

Of the other two specimens described as females, No. 21319 is a typical male, and this leads to a misunderstanding. The only female then, which Dr. Stejneger had was No. 113450. He mentions among true individual differences, the curious white ring around the eye in one specimen, the transposition of the white anterior wing-bar, the coloring of the lining of the wing, etc. These will be referred to again.

Salvadori, 1895, confesses that he does not understand the species. He thinks that domesticated mallards might have become feral and influenced *A. wyvilliana*. This seems to me to be not at all probable because of the small size of the species and its perfect uniformity as to measurements. Salvadori calls attention to the characters that distinguish the adult males and shows that young birds resemble adult females.

Rothschild, 1900, in two fine plates shows well the Mallard affinities of the species. His series is a large one and especially interesting are the few white flank feathers finely undulated with blackish brown which, together with the faint cross-barring on the abdomen occur only in his oldest males.

This series shows nothing of this sort and it is therefore probable, as suggested by Rothschild, that final male plumage is not obtained for several years. He picks out his younger males by the presence of spotted abdomen and absence of curled retrices, but this diagnosis would not hold in the series at hand, as will be seen in the above description of the males.

Rothschild calls attention to variability, which he considers greater in the female. In some of his female specimens white tips were present on the coverts which form the anterior edge of the speculum. The different appearance of the under wing-coverts

in his specimens is a form of variation which along with some others he says he cannot account for.

Aside, then, from certain other curious variations, we have in this species male birds with Mallard affinities readily distinguished from the females, a juvenile plumage like the females (Rothschild) very likely a partial eclipse plumage,—in which the males lose some of their characteristics,—and almost certainly some changes due to age. The lack of accurate dates makes any assumptions on this last point merely guesswork. A good deal of the difference in color of the lower parts in this series is, I believe, due to staining during life.¹

I should like to point out what is at once the most noticeable variation, and one that is certainly separated from any question of age. This has to do with speculum bars.

In the males the first band anterior to the speculum is always black, but next to this there is a wide range of color difference. In one case there is a broad white band, in two cases a narrow white band, in two other cases a very indistinct buffy band, and in one case no band other than the black one, which here is very finely tipped with whitish.

In the females (*A. aberti* included) the anterior margin of the speculum is, in four specimens, bordered by a black band formed by black tipped greater coverts, next comes a band of buff color which shows a marked variation. In one case it is almost indistinguishable, while in three cases it varies from a very light buff to a russet color. In the fifth case, No. 113450, as Dr. Stejneger has described, the normal white bar is replaced by a grey one, while a new bar of pure white is interposed between the black bar and the speculum, an arrangement entirely unique and non-mallard like. The posterior end of the speculum appears to be always uniform, it is bordered by two bars, an inner black and an outer white. Thus we see a general tendency to variation anterior to the speculum, as was previously pointed out for *A. diazi*. There are several other minor points of interest about *A. wyvilliana*, one of which is a slight tendency to albinism in at least three specimens.

¹ cf. Wilson Bulletin, XXI, p. 221.

ANAS ABERTI — ABERT'S DUCK.

This duck, represented by the single type specimen, taken at Mazatlan on the west coast of Mexico, was described by Mr. Ridgway in 1878 (Proc. U. S. Nat. Mus., Vol. I, p. 250).

At that time *A. wyvilliana* had just been described by Mr. Sclater from a male specimen, and the sex dimorphism of that species was not recognized. Mr. Ridgway compared his *A. aberti* (Type No. 12789 U. S. Nat. Mus.) with a specimen of *A. wyvilliana* thought to be a female. It appears, however from his description (p. 251) that this bird must have been a male (V-shaped breast markings, densely streaked throat, etc.) so that the similarity of *A. aberti* and *A. wyvilliana* escaped his notice.

In 1888 Dr. Stejneger (Proc. U. S. Nat. Mus., Vol. II, p. 99) took up the question of *A. aberti*. He says: "So close is the similarity that I am unable to distinguish No. 113450 (*A. wyvilliana*), from the type of *A. aberti* except by the larger size and the total absence even of an indication of supraocular or transocular stripes." Now a comparison of the size of *A. aberti* with four other undoubted female specimens shows that it is in one case even larger than *A. wyvilliana*. As to the stripes on the head, I can see no difference in comparing the two specimens above referred to by Dr. Stejneger and at best the supraocular and transocular stripes in the Hawaiian ducks are very indefinite. They are barely perceptible in the female and absent in the male.

A careful comparison of the type of *A. aberti* with the four other undoubted female specimens in this museum and the National Museum shows no essential difference in color, pattern or size, hence it appears that in the absence of any further material from Mexico *A. aberti* must be considered as a female Hawaiian duck, accidentally occurring in Mexico and no longer deserving a specific name. These facts are now probably perfectly familiar to Mr. Ridgway so that the above remarks are not to be taken at all in a critical sense.

FEMALES, A. DIAZI.

	57247	54132	57252	57239	57253	57251	54130	54129	54135	54131
Length of culmen	53	52	50	49	52	52	48	52	50	51
Depth of bill at posterior end of nostril	16	17	15	18	18	18	16	17	16	18
Tarsus	44	42	42	42	44	42	40	42	43	44
Wing	250	263	250	250	252	240	225	250	251	252

FEMALES, A. DIAZI.—Continued.

	54133	54125	54135	54126	54127	54123	54128	
Length of culmen	51	52	51	52	48	53	50	mean = 51
Depth of bill at posterior end of nostril	19	17	17	18	18	18	19	mean = 18
Tarsus	42	41	43	43	42	44	46	mean = 43
Wing	238	260	225	256	250	235	241	mean = 246

MALES, A. DIAZI.

	57246	54124	57250	57238	57256	57257	54122	
Length of culmen	52	55	53	54	50	53	51	mean = 52
Depth of bill at posterior end of nostril	21	19	18	19	18	19	18	mean = 19
Tarsus	44	46	46	43	44	46	44	mean = 45
Wing	275	270	245	241	280	225	272	mean = 258

MORNING AWAKENING AND EVEN-SONG.¹

BY HORACE W. WRIGHT.

At my summer home at Jefferson Highland in the White Mountains, New Hampshire, I have been interested in obtaining, as nearly as careful and systematic effort would enable me to do, the order and manner, in which the summer-resident birds within range of hearing awake and voice themselves. Already some general impressions that the birds of certain species sang earlier than those of certain other species had been received, but it seemed to be worth while to obtain some exact records and learn whether there were definite and distinctive habits belonging to the common birds in regard to the time when they begin to sing. It was resolved, therefore, to procure a series of early morning records for comparison, and fifteen such records are now possessed, obtained on May 27 and June 2, 1902; June 8 and 28, 1903; June 11 and 16 and July 5 and 9, 1904; June 10, 1905; July 9, 1906; July 4, 1908; June 27, 1909; July 4, 1910; and June 28 and July 4, 1911. The range of date is nearly equidistant before and after the summer solstice. The variation in time of sunrise for thirteen of the records is but five minutes, the earliest sunrise, 4.02 o'clock, occurring midway within the dates of these thirteen records. The two other records extend to a variation of nine minutes in the time of sunrise. These variations affect but slightly the resulting averages of time derived from the series and have no effect to alter the relative places of the species in the order of their awakening. So they have been regarded as negligible. This period of the season was chosen, because it is the time when the birds in general are singing most freely and are definitely located for nesting.

That the first bird-note of the morning might be chronicled and assurance be had that the earliest had been heard, position has usually been taken fifteen or twenty minutes previous, as the experience of the first two or three occasions indicated the time to be. This has been done from 2.35 to 2.50 o'clock. The position

¹ Read before the Nuttall Ornithological Club, Cambridge, Mass., April 1, 1912.

taken on each occasion has been upon the driveway midway between the house and the road, or about fifty feet from either, with open lawn around. The record has usually extended over two or two and a half hours, that is, up to 5 or 5.15 o'clock.

The elevation of the location is about 1600 feet above the sea. The place is situated on the southwestern slope of Boy Mountain, which is a part of one of the secondary ranges and rises to a height of 2240 feet, the summit being somewhat north of east. The sunshine, therefore, is delayed in reaching the location and its immediate vicinity. The rays of the sun are seen on the mountains across the narrow valley some time before they have reached the listener's position, and still earlier they have brightened with rosy light the heads of the Presidents uplifted higher into the sky. Thus there is a pervasive light thrown around much before the birds whose voices have been chronicled come within the range of the sun, which is not until forty-five minutes or an hour after its actual rising.

A row of maples together with other shade trees borders the nearer roadside, while across the road, beyond a mere border of grass land, mixed woodland reaches up the mountain side. Farther eastward from this woodland is open, rocky, hillside pasture, dotted with individual spruces and firs. Mowing fields stretch away southeastward. Westward and about five hundred feet distant woods of mixed growth extend to the river which is some three hundred feet below in the valley bottom. These woods are well occupied by songsters, especially warblers of many species, whose songs are heard when at the close of the morning-awakening record the footpaths through them have been followed. But these voices within the wood have seldom reached up to the position chosen and entered the records obtained. The warblers and other songsters, however, which occupy the woodland bordering the road are well within the range of hearing, as well as the birds of the fields, the open hillside pasture, and the roadside.

Taking position with paper block in hand and assisted to make notes by the light of a small electric lantern or a candle, as the case may be, the first bird-note has been waited for. Meanwhile a few minutes of complete stillness have continued the silence of the night, this stillness being broken only by the distant sound of

the flowing river or by the occasional piping of a hyla or croaking of a frog in a pond-hole some distance away, and once by the voice of a Whip-poor-will coming up from the valley. A few fire-flies flitting about have often given a touch of animation to the foreground. Although at this time the darkness of night still prevails, the first glimmer of light has been apparent in the eastern sky even at 2.40 or 2.45 o'clock. This is soon followed by the first bird-notes, a Song Sparrow or a Chippy not far away breaking forth into its song once, or perhaps the song of an Alder Flycatcher in the middle distance once given, or the twitter of Barn Swallows at the nearest farm barn, or the sudden awakening and cackling of a Robin near by. Our neighbor's cocks also awake and crow at this time. The sparrows mentioned above at first give repetitions of their song at intervals only, two or three individuals of each species thus expressing themselves, but presently a Robin breaks forth into singing and continues with scarcely an interruption for about forty-five minutes, singing most joyously. The first Robin is soon joined by a second and a third and a fourth, their voices uniting in a loud and exuberant chorus. One Chipping Sparrow after another also joins in until three or four are singing, and these repeat their trills shortened from the usual length in a most hurried and excited way, seeming to be animated by a spirit of eager haste which is not manifested in their singing later in the day. Already one voice after another from several different species within range has joined in the concert. Meanwhile the pale light of the dawn has gradually brightened in the eastern sky and a faint light has begun to be diffused around. This is still quite dim at 3.15, but at 3.25 or 3.30 it has become sufficient to dispense with artificial light and begin to see by the light of day.

The birds remain on their night perches apparently until after 3.30 and commonly until 3.45 or 3.50, or even 4 o'clock. For the voices up to this time come from the same locations and the songs reach the ear unchanged in sound as to direction or distance. Moreover the light by 3.30 o'clock has become sufficient for discerning a bird if it were in motion. The earliest record of movement which has been noted, with one exception mentioned later under the Robin, was that of a Chipping Sparrow dropping from its perch in a maple by the gate to the driveway at 3.30 and con-

tinuing to sing there. On two other occasions, two years apart, a Chippy which had evidently spent the night in this maple by the gate dropped down onto the gate-post at 3.43 and 3.49 respectively. Barn Swallows have passed singing at 3.32 and 4 o'clock. A Robin was once seen to fly at 3.35 from one roadside maple to another. A Hummingbird once flew by at 3.52 and on another occasion was seen hovering among apple blossoms at 4 o'clock. The earliest Crow on the wing was seen at 3.53 and on another occasion at 4 o'clock. Two Cedar Waxwings once flew forth and about at 3.56 o'clock. The earliest Phoebe in flight dropped into the road at 4 o'clock. By 4.15, or directly after sunrise, there is general movement and activity. By that time most of the usual birds in the neighborhood have sung, and some have already finished their welcome to the day and are busily seeking their food.

On the fifteen occasions forty-six species which had spent the night near by have been recorded. Thirty-four of these were heard on many or several occasions, and twelve on one or two occasions only. The records of the latter class, however, are definite and, perhaps, of not inferior value. They represent species usually beyond the range of hearing yet on the single occasion or two located near. On three of the occasions nineteen or twenty species only contributed to the concert, but on five others twenty-nine or thirty different voices were heard.

Mornings that were calm and of about normal temperature were chosen. But twice the temperature was as low as 46° and 52° and once as high as 76°, namely, on the morning of July 4, 1911, a new maximum night record. Several mornings were clouded, however, the cloudiness increasing and two or three times culminating in rain a half-hour or so before the usual time of closing the record. Under these conditions some later voices naturally failed. Thus on July 4, 1910, a few drops of rain fell at 4 o'clock; at 4.23 there was a distant roll of thunder and a storm-cloud was seen to fill the western sky; at 4.35 it became very dark, and a few minutes later wind and rain had come. In ten minutes more the force of these had passed, but a gentle rain continued. Every voice had been stilled by the brief tempest, and when its noise had subsided not a note was heard. Five minutes later a Song Sparrow sang. Twenty species only had voiced themselves before the rain.

It does not appear that cloudy conditions have had an influence to any extent in delaying the time of early song. The records indicate that the early-singing sparrows and flycatchers, the Robin and other thrushes sang as early on some clouded mornings as on some fair mornings and in some instances even a few minutes earlier. Neither has the moon appeared to exert any influence, as it has usually been either the time of new moon, or a day or two before, or when it was in the first quarter, in all which phases there has been no moonlight at the time of morning-awakening. On four occasions when there was moonlight the sky was clouded, and the records indicate that the earliest singers were a trifle later in beginning to sing, the cloudiness offsetting whatever gain of light from the moon there may have been. It is a question, not answered by the records, whether bright moonlight influences the early songsters to sing earlier than when the sky is only starlit, since none of the records have been obtained under moonlight. It seems, however, not unlikely that bright moonlight has no effect to awaken earlier the early-singing birds, but that they instinctively await the first glimmer of daybreak before singing.

The combined records indicate that the birds of thirty-three species averaged to sing before the time of earliest sunrise, that being 4.02 o'clock. Included among these are nine members of the sparrow family, five of the common sparrows having place among the earliest eleven songsters; all six members of the thrush family from the Robin as the third bird to the Olive-backed Thrush as the seventeenth; the five common flycatchers, these having place among the earliest nineteen songsters; Black-billed Cuckoo, Ruby-throated Hummingbird, Crow, Barn Swallow, Red-eyed Vireo, Blue-headed Vireo, Chickadee; and six species of warblers, all which have place among the last sixteen of the thirty-three species which sing before sunrise. The Oven-bird, the earliest warbler, does not average to sing before 3.29 o'clock, or thirty-three minutes after the Song Sparrow and twenty-seven minutes after the Robin. The Redstart, the next earliest warbler, does not sing until seventeen minutes later. Then in the sixteen minutes preceding sunrise five other warblers begin to sing. Still five other species of warblers have not been heard until after the sun has risen. Perhaps in other locations some of the warbler voices would have been

earlier heard, but they have been listened for most carefully and have not been detected earlier than as recorded. The warblers, therefore, as a family appear to be comparatively late-awakening birds to sing. Most of the common sparrows and the flycatchers and all the thrushes precede them. The warblers also at the close of the day cease singing early, again the common sparrows and the flycatchers and the thrushes outdistancing them in extension of song, as in the morning by beginning earlier to sing. The Bobolink apparently waits for the sun to appear and then rises joyously on wing and pours forth his abundant song. The calls of the woodpeckers come after sunrise, and the voice of the Swift is then first heard.

The principle of averages which has been adopted for the record was suggested by the diversity of time of first song on the part of birds of many of the species, of which several records had been obtained. But if the relative order of species be based on the earliest singing of an individual upon any one occasion, still ten of the first eleven species in the list remain the ten earliest songsters, although the relative position in the case of several is somewhat changed. On this basis Song Sparrow remains first, having sung at 2.40; Chipping Sparrow remains second, at 2.45; Robin remains third, at 2.46; Barn Swallow becomes fourth, also at 2.46; Vesper Sparrow is fifth, at 2.47; Alder Flycatcher is sixth, at 2.53; Savannah Sparrow is seventh, at 2.54; Hermit Thrush is eighth, at 2.56; Phoebe is ninth, at 2.57; and Wood Pewee is tenth, at 2.58 o'clock. The White-throated Sparrow, sixth on the basis of averages, takes a lower place in the order, not having been heard earlier than 3.05 o'clock. Fractions of a minute resulting in deducing averages have been discarded. Where two or three species are recorded alike in time of awakening to sing, the fractions, smaller and greater, have determined the order of precedence. In instances, in which a time record or two of a species are considerably later than most records of the species and would tend erroneously to make the average time of first song somewhat later, these records have been eliminated in the reckonings, with the sole purpose of obtaining results most closely in accordance with the facts.

The author would desire it to be understood that, while he has endeavored to be accurate, he regards the figures of time given as

close approximations to the true rather than as absolutely exact. And it should also be understood that the entire paper is the result of the author's records and individual experience in this mountain hamlet.

The order of awakening follows in detail. It should be borne in mind that the time of the earliest sunrise within the period of the season covered is 4.02 o'clock.

1. The SONG SPARROW (*Melospiza melodia melodia*) breaks forth into song in an occasional way first of all the birds, much as it has sometimes been heard to do in the hours of the night, giving, it may be, a single rendering or two only. A second and a third bird usually promptly follow the first, also singing in this occasional way, and thereby differentiating this singing from the casual expression of song of a single bird in the night hours. The earliest recorded time of song is 2.40 o'clock. On six other occasions the times of first song have been 2.47, 2.52, 2.54 (twice), 2.56, and 2.59 o'clock. On four occasions the first song was at 3 and on one other at 3.10 o'clock. This occasional singing at intervals often continues for forty-five minutes, and then the songsters give themselves over to song for a period, their voices becoming more prominent in the morning chorus. The records of these twelve occasions establish the average time of the first song as 2.56 o'clock. The average time of more free and constant singing is 3.36 o'clock. The very infrequent repetition of the song for the first forty-five minutes, or thereabouts, constitutes the Song Sparrow an inconspicuous first songster, while it really is the earliest in point of time, based upon averages of records.

2. The CHIPPING SPARROW'S (*Spizella passerina passerina*), earliest record for song is 2.45 o'clock. There are twelve records of first song between 2.45 and 3.15 o'clock. These establish the average time as 2.58 o'clock. As in the case of the Song Sparrow, the Chippy gives its trill, it may be, a single utterance or two only, and other repetitions may not come for some minutes; then another considerable pause may follow. But the second, third, and usually a fourth bird without much delay awakening to sing in this occasional manner, the singing must be regarded as the expression of morning song and be distinguished from the casual utterance of a single bird in the hours of the night, which is of a transient

and capricious character. This occasional singing often continues for fifteen or twenty minutes, while the birds are fully waking up; and then the several songsters begin to sing very rapidly, repeating their trills with precipitate haste and almost without pauses. I have never heard a Chippy sing in this manner at any other time of day. This rapidly repeated trilling is continued for a while, and then the birds, having apparently expended their surplus of energy, drop into their usual way of singing and continue indefinitely.

3. The ROBIN (*Planesticus migratorius migratorius*) comes third in the order of the awakening. Three or four singing birds are usually within near range. The earliest record of the song has been 2.46, when on June 27, 1909, a bird began to sing without previously calling, followed by a second bird in song two minutes later, and by a third bird singing three minutes later still. Often the Robin gives calls a few minutes before breaking into song. The average time of first song based on twelve records is 3.02, the time ranging from 2.46, 2.53 and 2.54 to 3.10 and 3.12 o'clock. The birds with little variation continue to sing lustily and joyously for forty-five to fifty minutes. Then there is a pause of some length during which scarcely a robin song is heard, and within the hour following the first period of free singing only occasionally is the song given and only for a brief time usually. The period of exuberant singing is from 3.00 or 3.10 to 3.45 or 3.50 o'clock. Before 4 o'clock, therefore, the Robins have poured forth their ecstasy of song, not to be equalled again during the day, howbeit, one and another may indulge in periods of singing at almost any hour. All sing together at the early hour named and with the joyousness and freshness of spirit which daybreak inspires.

On July 4, 1911, the father of a brood, snugly in their nest among the woodbine clambering on the front of the house, wakened on his night perch in a maple by the roadside at 2.50 and suddenly gave a few loud calls. After a minute or two, with solicitous thought of his family, it was evident, he flew to the end of the ridge-pole, and stationing himself, quietly for a moment, at 2.53 broke forth in calls again, and these were immediately followed by song much more softly voiced than usual and continued a briefer time. This short flight constitutes the earliest bird-movement on the wing which I have discerned.

The lusty character of the Robin's song from the time of its beginning throughout its first forty-five minutes' period of singing constitutes it the conspicuous early singer and makes it appear to be the earliest singer of all, whereas the Song Sparrow and the Chipping Sparrow both precede the Robin in a few earlier expressions of song. These, however, are later than the Robin in giving themselves over to singing and in attaining the full spirit of exuberance which the Robin attains at once upon beginning to sing.

4. The ALDER FLYCATCHER (*Empidonax traillii alnorum*) was once heard to sing as early as 2.09, repeating the song at 2.23 and again at 2.35, on June 16, 1904. On another occasion a bird sang at 2.18 twice and at 2.29 again. These, doubtless, should be regarded as utterances in the night, such as the Song and the Chipping Sparrow and the Oven-bird have sometimes been heard to make. These birds began to sing in the usual way with repetitions after short pauses at 2.53 and 2.54 respectively. Ten records furnish the average time of 3.03 for the first singing, the range having been from 2.47, 2.53 and 2.54 to 3.15 (twice). The song is often continued thirty or forty minutes, but sometimes is lost to the ear much sooner. Frequently two birds have been within the range of hearing, the second beginning to sing soon after the first.

5. BARN SWALLOW (*Hirundo erythrogastra*). The twitter of a colony at a neighboring farm barn has been one of the earliest sounds. It is steadily maintained and seems to proceed at first from the birds on their night perches. The earliest record is 2.46 on July 9, 1906. Other earliest records are 2.51 and 2.59 (twice). The average time based on eleven records is 3.04 o'clock. A little later the song comes from the air as the birds circle in flight,—once even as early as 3.32,—when the light is still quite dim and scarcely any other birds have left their night perches.

6. The WHITE-THROATED SPARROW (*Zonotrichia albicollis*) is not located within hearing on the Highland, but is a regular summer resident of the valley. Only occasionally at any hour has its voice been heard at the house or in the yard. But on June 27, 1909, at 3.06 the song came up distinctly to the ear and was recorded. On one other occasion, June 23 of the same year, when I was at Cherry Pond for the night, the song was first heard at 3.05 in the morning from a bird near at hand.

7. The WOOD PEWEE'S (*Myiochanes virens*) voice has not always been within hearing. Eight records give the average time of its first song as 3.06 o'clock. The earliest record has been 2.58 and the latest 3.12 o'clock. A single singer only usually joins in the concert, and his plaintive song has reached the ear in an occasional way.

8. The VESPER SPARROW (*Poæcetes gramineus gramineus*) also comes into the group of birds which sometimes sing before 3 o'clock. The earliest occasion was at 2.49; the next earliest at 2.58 o'clock. The average time of beginning to sing, based on nine records, is 3.07 o'clock. Sometimes two birds have been within hearing. The singing is continued commonly for forty-five minutes or an hour without long pauses.

9. The HERMIT THRUSH (*Hylocichla guttata pallasi*) invariably calls for a few minutes before breaking into song. When a bird has been located near, the calls have always been first noted; but when the birds are more distant, the song comes as the first voicing heard. Therefore the species has been assigned its place on the basis of the time of its beginning to sing. Three or four singing birds have sometimes been within the range of hearing. The average time of the first call heard, based on ten records, has been 3.06 o'clock. The earliest records are 2.56 and 2.59 o'clock. The average time of the first singing is 3.11, or five minutes later than the first call. The song is always continued in the beautiful, calm manner characteristic of the species, first in one of the three registers and then in another with endless variety of change, quite indefinitely; with pauses, to be sure, but it is likely to be heard much of the day, even at noon. At Cherry Pond the first singing of a Hermit Thrush in the morning was at 3.10 o'clock.

10. PHOEBE (*Sayornis phæbe*). The usual time of awakening places the Phoebe tenth among the earliest birds. Ten records furnish the average time of 3.11, when the song has first been heard. The earliest awakenings have been 2.57 and 3.05 o'clock. The song is usually continued without much pause for an hour or more. On June 11, 1904, a near bird broke out demonstratively at 3.10, contributing the Phoebe song of the morning.

11. SAVANNAH SPARROW (*Passerculus sandwichensis savanna*). The light voice of this bird is sometimes not near enough to be

heard, and it is also lost at times when the music of the morning becomes *fortissimo*. Based on seven records, the average time of the first song is 3.12 o'clock. The earliest awakening was at 2.54 on June 10, 1905, when the song was given once, followed by another rendering at 3.00, another at 3.07, and the next at 3.15, after which the song was constant with brief pauses only. The average time of getting into constant singing is 3.27 o'clock. One bird only is usually within hearing.

12. The VEERY (*Hylocichla fuscescens fuscescens*) is usually located too remotely to be heard among the near songsters. Toward the end of the recording the voice of one has been heard on three occasions, either calling or singing, some distance below, namely, at 4.40 and 5.00 (twice). But after the night at Cherry Pond, in the haunt of the Veery the song was heard at 3.13 in the morning from one bird, soon followed by three others. This record, which plainly should take precedence, places the Veery near the Hermit Thrush in the time of its beginning to sing.

13. The BLACK-BILLED CUCKOO (*Coccyzus erythrophthalmus*) has twice been heard at 4.15 and 4.29 respectively. On a third occasion, when I was at Cherry Pond, one began to call at 3.20 in the morning. This record, obtained in the haunt of the Cuckoo, should give the species its relative place, as the later records undoubtedly were not the first morning voicings of the birds.

14. The KINGBIRD (*Tyrannus tyrannus*) has been located but once within the range of hearing. On July 4, 1908, at 3.22 one was heard. On the occasion of my spending the night at Cherry Pond a bird was first heard at 3.24 in the morning. These two records furnish an average time of 3.23; although it is not improbable that if other records had been obtained, the Kingbird might rank somewhat earlier in the list.

15. The BLUEBIRD (*Sialia sialis sialis*), has been located several seasons beyond the range of hearing. Four records furnish an average of 3.25 as the time of first singing. The variation is small, namely, 3.20, 3.24, 3.27, and 3.30 o'clock. The call was heard on one occasion at 3.15 o'clock. Usually the song is continued but a few minutes, five to twenty, when the bird passes out of hearing or becomes silent. But on July 9, 1904, one beginning to sing at 3.20 continued its song most joyously and steadily until

4.30, so that the record states "Have never before heard so much bluebird song in an hour; the singing is almost as loud as a robin's."

16. The WOOD THRUSH (*Hylocichla mustelina*), as yet a rare bird in Jefferson, in three seasons has been located well within hearing, namely in 1904, 1905, and 1908. Five records have been made, three having been obtained in 1904. The earliest singing was at 3.25 on June 16, 1904. On June 11, 1904, and June 10, 1905, the song first reached the ear at 3.26 on both occasions. On July 5, 1904, and July 4, 1908, it was first heard at 3.38 o'clock. On the earliest occasion the bird continued its song for thirty minutes without much change of location and then moved farther up the mountain side and was heard at intervals for another thirty minutes. Upon the next two earliest occasions the song was heard for five or ten minutes only, when the bird probably moved out of hearing. On the fourth and fifth occasions, when one was first heard at 3.38, the voice was well back in the woodland on the mountain side and twenty minutes later had come much nearer. Not unlikely the bird at each of these times had been singing earlier. The relative position of the Wood Thrush, therefore, would seem to be properly based on the three earlier records, when the songster from the beginning was located near. The average time of first song will then be 3.26 o'clock. The voice has always been in association with the Hermit Thrush's and sometimes also with that of the Olive-backed Thrush.

17. The OLIVE-BACKED THRUSH (*Hylocichla ustulata swainsoni*), while an abundant bird in all woodland, has been favorably located for hearing its first song on three occasions only, the listener's position being in the open, while the Olive-back is commonly too far within the wood, both in front and rear, for its voice to be readily heard. The average time of its first song on these occasions was 3.27, the three records being 3.21, 3.26 and 3.35 o'clock. On two of these occasions the songster continued to sing with only slight interruptions up to 5 o'clock, when the record was closed. So the voice was recorded as the most regular and constant among the voices of the morning.

18. The OVEN-BIRD (*Seiurus aurocapillus*) is the earliest of the warblers to voice itself. Like the Song Sparrow and the Chipping

Sparrow it occasionally breaks forth in the night, giving a song which is after the manner of its flight song, although the bird at so early an hour may not leave its perch. On June 27, 1909, one burst forth in such a song at 2.12 and was again heard at 2.57, while it was 3.43 when it began to sing in its usual way. Eleven records give the average time of first song as 3.29, the earliest records, eliminating night utterances, having been 3.09, 3.12, and 3.17, and the latest 3.41 and 3.43 o'clock. Two birds have often been heard.

19. The LEAST FLYCATCHER (*Empidonax minimus*), while located both higher and lower on the mountain side, has been but once within the range of hearing. On June 28, 1911, the song from one located near was heard at 3.30, and the bird continued to sing up to 5 o'clock or later. It is not improbable that if more records had been obtained, the Chebec might rank higher in the order, as do the other common flycatchers.

20. The FIELD SPARROW (*Spizella pusilla pusilla*), is a rare bird in Jefferson. But one was temporarily located in 1911 on the mountain side, and its voice entered the morning-awakening record on July 4 at 4.06 o'clock. It had undoubtedly been singing earlier, and the voice had not reached the ear. At 4.24 the song was heard much more plainly. On June 19, 1908, a Field Sparrow had been heard singing eight or ten times beginning at 3.30, before I rose, and was still singing in the neighborhood at 5.15 o'clock. This earlier record places the Field Sparrow among the other sparrows, which as a family are early singers.

21. SLATE-COLORED JUNCO (*Junco hyemalis hyemalis*). The range of record of the Junco's first singing is rather wide, extending from 2.55 and 2.58, when the song was heard only once or twice on two occasions, to 3.49, 3.50 and 3.51 on three other occasions. The average time based on thirteen records is 3.31 o'clock. The song is often continued for more than an hour. Usually one bird only has been within hearing.

22. The CHICKADEE'S (*Penthestes atricapillus atricapillus*) song has been heard on six occasions, namely, at 3.30, 3.43 (twice), 3.45 (twice), and 3.50 o'clock. The average time has been 3.43 o'clock. On May 27, 1902, one beginning to sing at 3.43 continued his song for some time.

23. RED-EYED VIREO (*Vireosylva olivacea*). The song being of a quiet and monotonous character and as such not appealing strongly to the ear, at least such is the recorder's usual experience, particular pains have been taken to note the time of beginning of its song and not allow it to pass unnoticed. Four or five birds are usually within the range of hearing. As 3.33 is the earliest time recorded, the species does not awake early to sing. And the range of time of first song which thirteen records furnish indicates a small variation only, as the latest time recorded is 3.53 o'clock. On four occasions it has been between 3.33 and 3.39 and on nine other occasions between 3.41 and 3.53 o'clock. The average time of the thirteen records is 3.43 o'clock. Sometimes the phrase of the song is repeated quite rapidly for a few minutes at the time of beginning. Usually the birds continue to sing without much pause for thirty or forty minutes or even an hour, and then, as is well known, with short rests most of the day.

24. The CROW (*Corvus brachyrhynchos brachyrhynchos*) is a comparatively late riser, as it ranks twenty-fourth among the common birds in the time of voicing itself. While it is not the twenty-fourth bird on any one occasion, since all its predecessors which have been named in order do not appear in the chorus on any one morning, it has always been the twelfth bird or later in the succession of the awakening. Fourteen records show that the earliest times at which a Crow has been heard to call were 3.35 and 3.36 o'clock. On the former occasion Chipping Sparrow, Robin, Alder Flycatcher, and Vesper Sparrow had sung at 2.45, 2.46, 2.47 and 2.49 respectively. The average time of the first call is 3.44, or not until after the Robin has sung for forty-five minutes or even an hour and from eleven to sixteen species have already voiced themselves. The range in time is narrow, since the latest is 3.56 o'clock. The variation, therefore, in the Crow's awakening is only twenty-one minutes on the fourteen occasions ranging in date from May 27 to July 9 and covering ten seasons. If the latest-time record were eliminated, the latest remaining would be 3.52, and the variation for thirteen records would be but seventeen minutes, constituting the Crow one of the most regular of the common birds. A single bird is usually first heard located somewhere upon the mountain side, and later two birds often appear in flight. The Crow was

earliest seen in flight on one occasion at 3.47 o'clock, when two passed silently overhead. On one other occasion a single bird was seen on the wing at 4 o'clock.

25. REDSTART (*Setophaga ruticilla*). If the Oven-bird be excepted, the Redstart introduces the warbler singing. All warbler song is delayed on the average until 3.29, when the Oven-bird begins to sing. The Redstart, based on ten records, averages to sing seventeen minutes later, or at 3.46 o'clock. It has been heard once as early as 3.26, but on three other occasions was first heard at 3.55, 3.56 and 3.58 respectively. Two and sometimes three birds sing within hearing. On June 28, 1911, the first bird began to sing at 3.41, the second was heard at 3.49, the third at 3.52, and the three continued singing much of the time up to 5.15 o'clock.

26. The INDIGO BUNTING'S (*Passerina cyanea*) position in the list is based on six records. In some of the years no bird has been within hearing, although year by year several have been located in the neighborhood. In the seasons of record two and sometimes three birds have sung. The six records give the average time of first song as 3.51, and they vary but little, being 3.45, 3.50, 3.51 (twice), 3.54 and 3.58 o'clock. The birds after beginning to sing continue most persistently, for while there may be occasional pauses, yet the song is heard much throughout the day.

27. MARYLAND YELLOW-THROAT (*Geothlypis trichas trichas*). The first song, based on five occasions, when a bird was located near, averages to come at 3.51, the time ranging from 3.41 to 3.50, 3.53 and 3.55 (twice). The flight song in the night has sometimes been heard.

28. The BLACK-THROATED BLUE WARBLER (*Dendroica caerulescens caerulescens*) was heard on one occasion at 3.52, the bird being located near at hand. It is unusual for this warbler to be heard unless the listener goes within the woodland.

29. The BLUE-HEADED VIREO (*Lanius solitarius solitarius*) has been within hearing but once on these occasions. At other times and seasons its voice has been much heard near the roadside or from the wood borders, but at the season the records have been made the voices have been too much within the woodland and too far away on the mountain side to be heard. But on July 4, 1908,

at 3.52 one sang beside the road in the foreground. As the Red-eyes do not average to sing before 3.43, quite likely this single record is fairly representative.

30. The NASHVILLE WARBLER (*Vermivora rubricapilla rubricapilla*) has been heard but twice, namely, at 3.50 and 3.56 o'clock. The nesting haunts of the species on the Highland are usually beyond the range of hearing. The time of first song based on the two records obtained, when a bird was located sufficiently near, is 3.53 o'clock.

31. The MAGNOLIA WARBLER (*Dendroica magnolia*) has been heard on seven occasions, the time of the first song varying from 3.42 (twice) and 3.47 to 4.09 (twice). The average time is 3.55 o'clock. On the two other occasions the first song heard was at 3.58 and 3.59 o'clock. A single bird only is usually within the range of hearing and is sometimes heard at intervals for twenty or thirty minutes or even an hour.

32. GOLDFINCH (*Astragalinus tristis tristis*). The first call, as based on eleven records, averages at 3.58 o'clock, the time ranging from 3.49, 3.50 (twice), 3.52 and 3.54 to 4.10 and 4.18 o'clock. Calls have invariably constituted the earliest records, and later by some minutes the song has been heard, if given at all; for in June and early July the joyous outpouring of song on the wing is not as much given as somewhat later in the season.

33. The BLACK AND WHITE WARBLER (*Mniotilta varia*) has been heard on one occasion only, namely, at 4.04 o'clock.

34. PURPLE FINCH (*Carpodacus purpureus purpureus*). The relative position is based on ten records which range from 3.18, 3.37 and 3.43 to 4.40 and 4.46 and furnish an average of 4.05 as the time of its first voicing. On several occasions a bird has sung. At other times the call-note only has been heard either from one in flight or from several feeding in a near Juneberry tree (*Amelanchier canadensis*), which were giving little thought to song, while they eagerly feasted on the small fruit. In this tree on July 4, 1908, at 4 o'clock one sang while several were engaged in feeding. On another occasion two were seen in this tree silently eating the fruit at 4.20, which had given neither call nor song that had been heard and were apparently absorbed in first satisfying their hunger.

35. The BLACKBURNIAN WARBLER (*Dendroica fusca*) has fur-

nished five records, when one has been located favorably within hearing. The time of first song has ranged from 3.40 to 4.17, but on the three other occasions was earliest heard at 4.05, 4.10 and 4.11 respectively. The average time is 4.05 o'clock.

36. The BOBOLINK's (*Dolichonyx oryzivorus*) time of first singing is based on nine records, ranging from 3.59 twice, 4.01 and 4.03 to 4.21 (twice) and 4.22, the average time being 4.10 o'clock. On June 11, 1904, it was precisely 4.10 when one first poured forth on the wing his song of ecstasy.

37. The YELLOW-BELLIED SAPSUCKER (*Sphyrapicus varius varius*) has been heard to call and drum on three occasions, the first sounds coming at 3.51, 4.10 and 4.30 respectively. The drumming is done upon telephone posts at the roadside. The calls usually come when the bird is at work upon birches or apple-trees. The average time of making its presence known has been 4.10 o'clock.

38. CHIMNEY SWIFT (*Chaetura pelagica*). As it passes in rapid flight through the air, the Swift's voice has been recorded on ten occasions, ranging in time from 3.58 and 4.00 to 4.24, and averaging 4.10 as the time of its appearance on the wing from its night's rest in the chimney. Thus the Swift appears only two or three minutes before sunrise at the earliest and usually delays until a few minutes after.

39. The BLACK-THROATED GREEN WARBLER (*Dendroica virens*) furnishes three records when one has been located within hearing. Usually the voices of the two or three birds in near woodland are not heard until one has gone within the woods. The time of first song heard on these three occasions has been 3.56, 4.17 and 4.26, which give an average time of 4.13 o'clock.

40. NORTHERN PILEATED WOODPECKER (*Phlæotomus pileatus abieticola*). There are eight records, when a bird has been heard loudly rapping in the distance with slow and measured blows or has called lustily and long, sometimes answered by another. The times of first hearings range from 3.46 and 3.55 to 4.39 and 4.48 and average 4.16 o'clock. Both the calls and the rappings are so loud that they cannot easily be overlooked even if the bird or birds be a half-mile distant either in the valley or on the mountain side.

41. CEDAR WAXWINGS (*Bombycilla cedrorum*) have made known their presence by their soft sibilant calls on seven occasions, the

time ranging from 3.56, 4.04 and 4.05 to 4.40 o'clock. On three occasions the records are 4.31 and 4.32 (twice). The average time when the birds were first heard has been 4.20 o'clock.

42. NORTHERN PARULA WARBLER (*Compothlypis americana usneæ*). The time of first singing is based on a single record, when the song was heard at 4.22 o'clock. The birds of the species with this single exception have been out of the range of hearing within the lower woodland.

43. The MYRTLE WARBLER (*Dendroica coronata*) has been within hearing on three occasions and has been first heard at 4.20, 4.26 and 4.30 respectively. The average time is 4.25 o'clock. In most seasons the small representation of the species in the immediate vicinity is located too far away to be heard from the listener's position.

44. The CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*) has sung on four occasions. At other times the species has been located too remotely to be heard. The four records furnish an average time of first song as 4.37, the earliest singing heard having been at 4.21 o'clock.

45. The DOWNY WOODPECKER (*Dryobates pubescens medianus*) furnishes seven records, when a bird or two birds have given either the single call-note or the long roll-call. The time has ranged from 4.17 to 5.00 and averages to have been at 4.43 o'clock.

46. The CANADA RUFFED GROUSE (*Bonasa umbellus togata*) was twice heard drumming in late May, 1902, at 5.10 o'clock on both occasions.

Other species entered into the records made, but as the birds apparently had not spent the night close by, but came within hearing in an adventitious way, they will simply be named and the time given when they were first heard: Whip-poor-will, 2.45; Nighthawk, 3.15; Ruby-throated Hummingbird, 3.52; Crossbill, 3.58; Crested Flycatcher, 4.00; Cliff Swallow, 4.08; Pine Siskin, 4.14; Scarlet Tanager, 4.15; Winter Wren, 4.15; Blue Jay, 4.21; Rose-breasted Grosbeak, 4.30; White-winged Crossbill, 4.30; White-breasted Nuthatch, 4.30; Tree Swallow, 4.40; Northern Flicker, 4.40; Mourning Warbler, 4.45; Prairie Horned Lark, 4.53; Canada Warbler, 5.00; Red-breasted Nuthatch, 5.00; Belted Kingfisher, 5.10; Olive-sided Flycatcher, 5.20 o'clock.

Several records at the end of the day have also been taken, but these are much more limited as to the number and variety of the voices participating than in the morning awakenings. By these records twenty-six species have been heard between 7 and 8.20, when the time of sunset was about 7.30 o'clock. Only three species of warblers have been heard to sing within this period and their last songs been recorded, namely, Redstart at 7.38, Magnolia at 7.40 and Oven-bird at 7.49, in each case the song being about as long after sunset as in the morning their respective earliest songs were before sunrise. An Oven-bird on one occasion gave its flight song at 7.28 o'clock. The Bobolink's last burst of song was at 7.20, or just before the time of sunsetting, as in the morning his first joyous song on the wing is at sunrise. The Indigo Bunting ceased singing about 7.23, or seven minutes before sunset. His morning record is ten minutes before sunrise. The Crow's last call came at 7.26 o'clock. The Goldfinch and the Purple Finch ceased at 7.25 and 7.35 respectively. They both enter the morning record a few minutes only before and after sunrise. The Crested Flycatcher was not heard to call after 7.27 o'clock. Chimney Swifts last scurried round in hurried flight giving their bubbling outpouring of notes at 7.28, two minutes before sunset; their morning record is eight minutes after sunrise. A White-throated Sparrow's voice from the valley was lost at 7.45, and a Field Sparrow's from the hillside at 7.48 o'clock. Three common flycatchers ceased to sing at about the same time, the Least at 7.44, Phoebe at 7.47, and the Wood Pewee at 7.50 o'clock. The latest twitter from Barn Swallows came at 7.54 o'clock. The last songs from Chipping Sparrow, Savannah Sparrow, and Song Sparrow were at 7.52, 7.55, and 7.57 respectively. All the five thrushes, Wood, Veery, Olive-backed, Hermit and Robin, were the latest of all the birds to voice themselves, with the exception of the Vesper Sparrow and the Alder Flycatcher, which were also among these latest singers. The Wood Thrush was last heard to call at 7.53 and again at 7.58 o'clock. The Veery sang up to 8 o'clock; two Olive-backed Thrushes to 8.02, and one to 8.05 o'clock. The Vesper Sparrow continued to sing to 8.07; and the Alder Flycatcher sang twice at 8.15 and 8.16, when his voice was hushed. The Hermit Thrush after a period of continuous singing gave his last

call at 8.17, and the Robin sang his last notes at 8.18 o'clock. The Robin and the Hermit are always close rivals as to which shall sound the last note. After an interval of two or three minutes, when neither has voiced itself, one or the other will again render a phrase of song or give a few calls. Calls are usually the last notes heard. The Robin generally triumphs by a minute or two. Then all the voices are hushed for the night, except that a Song Sparrow or a Chippy may break forth sleepily to give its song once even an hour later, as they sometimes do in the night before beginning their morning singing.

The same species, therefore, which sing earliest at daybreak also sing latest at twilight, and they cease singing, generally speaking, in a reversed order, although there are some variations in the order. These earliest and latest singing species are the common sparrows, namely, Vesper, Savannah, White-throated, Chipping, Field, Junco, and Song; the common flycatchers, Kingbird, Phoebe, Wood Pewee, Alder, and Least; and the thrushes, Wood, Veery, Olive-backed, Hermit, Robin, and Bluebird. Other species which awake to voice themselves but little before sunrise or after, cease to sing and call at sunset or a little later. Such are the Chimney Swift, the Crow, the Bobolink, the Purple Finch, the Goldfinch, the Indigo Bunting, the Cedar Waxwing, the Red-eyed Vireo, the Blue-headed Vireo, and the warblers in general. Habit in this respect seems to be adhered to as a law of the various species' being, from which they scarcely deviate. So not any of the earliest songsters of the morning cease to sing in the evening until some time after sunset, and several continue for almost an hour later. And on the other hand there are no species which awaken to sing late in the morning which continue to sing late in the evening. Those of the first group seem not to be dependent upon daylight for inspiration, but voice themselves in song in comparative darkness, while the others do seem to be dependent upon daylight and are silent except it be comparatively light.

Even-song is not extended as long after sunset as matins precede sunrise, since the earliest songs of ten species in the morning are given from an hour and five to twenty minutes before sunrising, while the latest ten songsters in the evening continue to sing only from twenty-four to forty-eight minutes after sunset. This

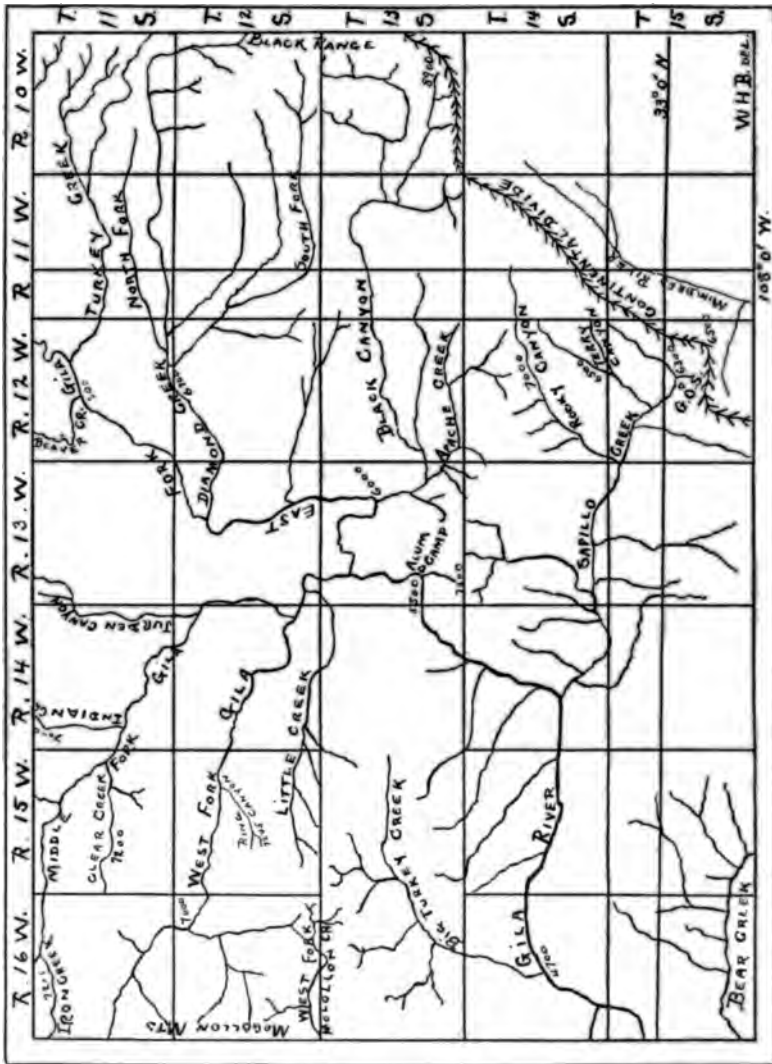
must be because even the birds grow weary by activity and become drowsy with overpowering sleep after the sun is withdrawn and even while a deep glow remains in the western sky delaying the darkness of night, while in the morning, refreshed by the night's sleep, these songsters respond to the first glimmer of dawn in the east by awakening to sing before any perceptible light has been diffused around, reinvigorated, buoyant, eager for the activities and joys of the new day.

OCTOBER BIRDS OF THE HEADWATERS OF THE GILA RIVER, NEW MEXICO.

BY W. H. BERGTOLD, M. D.

THE area in which the following records were made extends about forty-two miles east and west, and about thirty miles north and south: it is bounded on the east by the Black Range, which forms the continental divide, and too, the watershed between the Gila and the Rio Grande: on the south it is bounded by the Pinos Altos Mountains and their spurs, while to the north the area emerges in a mesa formation which, extending northward, terminates in the San Augustine Plains.

The Gila arises in this area from converging tributaries, runs westerly and leaves it near the southwest corner. As a whole, it is a wild and beautiful country, very sparsely settled, traversed by many streams, several of which are living throughout the entire year, and have eroded deep and picturesque canyons through which they now flow. Along these river bottoms, especially the main Gila, its three forks, Black Canyon, and Big Turkey Creek, there is a striking growth of cottonwood, sycamore, alder, walnut, boxelder, and ash, these trees being covered in many localities, by an abundance of wild grape and clematis vines, a growth which in the fall helps to paint a landscape of splendid color and striking effect.



The streams have carved the country into many rough hills and mountains, and, too, have left much mesa land between their canyons. The higher portions are well timbered with yellow pine (old and young growth), white pine, red and white spruce, and balsam fir, and with quaking aspen, the last especially in locations which have been fire swept. Lower down, and over more dry portions, there is a varyingly dense chaparral of juniper, piñon, scrub oak, and in those parts approaching desiccation, one finds mesquite, greasewood, and cactus.

The altitudes vary from 4700 feet at the junction of Big Turkey Creek and the Gila, to over 10,000 feet on Mogollon Mountain, and Black Range, where there are points nearly as high as on Mogollon.

The area is thus, east, south, and west, bounded by mountains of considerable height; the surface slopes rather gradually from the centre of the area to the higher margins, a condition preventing too rapid flow of precipitation to the lower levels, resulting in good forestation over a large portion of the country: Rixon¹ in his report on the forest conditions of the then "Gila Forest Reserve" (the area with which we are dealing forming nearly one third of this reserve) states that only about twenty-six per cent. of it is naturally timberless.

The region in its general characteristics and conditions, lends itself, as it were, to a variety of climates: in summer the lower portions approach closely the climate of southern Arizona, while at the same time the higher parts are almost alpine in nature; these two zones being separated by but a few miles, the area thereby forms a region of unusual zoological interest. It is highly probable that a thorough and systematic ornithological study of this area from one end of the year to the other would bring to light many points of considerable biological value.

The writer has visited, during October of each year since 1906, nearly all parts of the area under consideration, but he has been unable to do any extensive collecting, as these visits have always been by means of "pack outfits," and with no adequate facilities for preserving skins. Nevertheless they have made possible a

¹ Forest Conditions — Gila River, Forest Reserve, New Mexico. Theo. F. Rixon, Washington, 1905.

considerable list of birds collected or otherwise identified in the month mentioned: the list is of necessity incomplete, for it cannot include the large number of birds seen whose identity was suspected but not established beyond a reasonable doubt. This difficulty of identification is increased by the inherent peculiarities of the local bird fauna: many bird races overlap here and at times it is absolutely impossible to place a given bird in its subspecific niche without shooting it, which, during most of these trips, the writer was loath to do because he could not always preserve the skin.

Even with the skin in hand, there has been uncertainty as to the bird's exact relationship. A skin now in the writer's collection illustrates well the difficulties confronting him in recording the birds observed in this region, and too, the uncertainties which present themselves to present day bird taxonomists. It is that of a Junco, record No. 49 of the following list: the writer was quite uncertain as to the Junco race to which the bird belonged, and sent the skin, for identification, to two well known professional ornithologists. The first returned it saying, "It is impossible to state positively what the Junco is. . . . It is undoubtedly intermediate between typical *oreganus* and typical *shufeldti*, and, in my opinion, cannot be certainly referred to either"; and the second gentleman returned the skin with no comment but labelled, "*J. o. shufeldti*," under which identification it is here listed, not because this identification is of any greater value than the first, but as being the easiest way to untie the knot.

Another example, illustrating other difficulties one may meet in naming a species, is the skin of the bird recorded under No. 67 of this list; both of the above mentioned experts obviously agreed as to what it was, yet one called the bird "*Bæolophus wollweberi wollweberi* (= *B. annexus* Cassin)," and the second "*Penthestes wollweberi annexus*"!¹

It is with no captious feeling that the writer remarks on the increasing confusion and complexity of nomenclature in ornithological work, reflected by the above experiences. Ornithology is, with the writer, an avocation, not a vocation, and during the past

¹ It was to prevent such diversity as this, that the A. O. U. Check-List was published. The first expert identified the bird in accordance with the nomenclature of the List; the second according to his personal views, apparently without any explanation. [Ed.]

thirty years he has viewed with queer feelings the kaleidoscopic procession of names successively given to a species, the Robin, for example. It unquestionably is wise and correct to be guided by logical rules in such matters, and with this admission one may be permitted the hope that after a while *all* the older writings will have been unearthed, searched, and analyzed, and the exact priority as to a bird's name will have been determined.¹ Meanwhile, to one who loves the birds more when they are in the hills than when in the hand, and yet tries to add his mite to the grand total of ornithologic knowledge, the task of *trying* to remember the two or three more or less elusive and shifting scientific names of four hundred or more birds he may have become acquainted with during his lifetime, is hopeless — *Ars longa, vita brevis*.

Record No. 8, for obvious reasons, is made in the language of science.

It is a pleasure, as well as a duty, to here acknowledge with renewed thanks and appreciation, the unremitting kindness of Victor Culberson, Pres., J. B. Gilchrist, Treas., and R. F. Herndon, Secy., of the G. O. S. Cattle Co., without whose unfailing help these brief records could not have been made.

1. *Nettion carolinense*. GREEN-WINGED TEAL.— Four seen on a small reservoir in Terry Canyon, Oct. 7, 1906.

2. *Ardea h. herodias*. GREAT BLUE HERON.— Seen several times along the larger streams, the latest date being Oct. 24, 1911.

3. *Egretta c. candidissima*. SNOWY EGRET.— One taken Oct. 21, 1908, at the G. O. S. Ranch, previously recorded in *Auk*, January, 1909, p. 76.

4. *Actitis macularia*. SPOTTED SANDPIPER.— More or less common on the larger streams. Latest date, Oct. 16, 1909.

5. *Oxyechus vociferus*. KILLDEER.— Common on the larger streams. Latest date, Oct. 16, 1909.

6. *Lophortyx gambeli*. GAMBEL'S QUAIL. Common on the lower levels of the entire area.

7. *Cyrtonyx montezumae mearnsi*.— Locally known as the "Fool Quail." Common all over the area.

8. *Meleagris gallopavo merriami*.— Multi greges parvi videbantur per totam regionem.

9. *Columba f. fasciata*. BAND-TAILED PIGEON.— Seen in moderate numbers each year, in various portions of the area: — none seen in 1907;

¹ *c/* Notes and News, p. 431. [Ed.]

the latest date being Oct. 29, 1909, at the Alum Camp. Locally is called the "Passenger Pigeon," or the "Wild Pigeon."

10. *Zenaidura macroura carolinensis*. MOURNING DOVE.—Seen in very large numbers Oct. 22, and 23, 1907, at the mouth of Big Turkey Creek. One seen at Alum Camp, Oct. 28, 1909.

11. *Cathartes aura septentrionalis*. TURKEY VULTURE.—A few seen on Oct. 3, 1908, at the G. O. S. Ranch, and a considerable flock observed at the same place Oct. 6, 1911.

12. *Circus hudsonius*. MARSH HAWK.—A few seen at the G. O. S. Ranch each trip.

13. *Accipiter velox*. SHARP-SHINNED HAWK.—Several noticed at the G. O. S. Ranch during all of October, 1911.

14. *Buteo borealis calurus*. WESTERN RED-TAILED HAWK.—More less common all over the area, but not seen above 8000 feet.

15. *Aquila chrysaetos*. GOLDEN EAGLE.—Seen once at the G. O. S. Ranch in 1906, and on Oct. 15, 1909, on Black Canyon.

16. *Falco sparverius phalaena*. DESERT SPARROW HAWK.—One seen Oct. 6, 1906, on the divide between the Mimbres River and Black Canyon, at an altitude of 8900 feet.

17. *Otus flammeolus flammeolus*. FLAMMULATED SCREECH OWL.—One noted on Iron Creek, Oct. 19, 1909.

18. *Bubo virginianus pallescens*. WESTERN HORNED OWL.—One collected at the G. O. S. Ranch, Oct., 1906, and many Horned Owls heard during every other trip, which were presumably of this race.

19. *Ceryle alcyon alcyon*. BELTED KINGFISHER.—Seen every year along the larger streams, in moderate numbers. Latest date, Oct. 16, 1909.

20. *Dryobates villosus leucothorectis*. WHITE-BREASTED WOODPECKER.—Many seen during each trip, all supposedly of this race. One taken Oct. 23, 1910, at the G. O. S. Ranch was so identified by an authority.

21. *Sphyrapicus varius nuchalis*. RED-NAPED SAPSUCKER.—One taken Oct. 19, 1910, at the G. O. S. Ranch.

22. *Sphyrapicus thyroideus*. WILLIAMSON'S SAPSUCKER.—One taken in Rocky Canyon, Oct., 1906, and on Oct. 10, 1909, at the G. O. S. Ranch.

23. *Melanerpes formicivorus formicivorus*. ANT-EATING WOODPECKER.—Common over the entire area.

24. *Asyndesmus lewisi*. LEWIS'S WOODPECKER.—One seen Oct. 24, 1908, at the G. O. S. Ranch, and one at the forking of Diamond Creek, Oct. 16, 1909.

25. *Colaptes cafer collaris*. RED-SHAFTED FLICKER.—Abundant over the entire area.

26. *Phalaenoptilus nuttalli nitidus*. FROSTED POOR-WILL.—One seen at the G. O. S. Ranch Oct. 24, 1911, despite the fact that there had been severe frosts each of the preceding four nights, the days, however, being bright and warm.

27. *Sayornis sayus*. SAY'S PHOEBE.— Seen at the G. O. S. Ranch each October; latest date, Oct. 6, 1911.

28. *Cyanocitta stelleri diademata*. LONG-CRESTED JAY.— Abundant over the entire area.

29. *Aphelocoma woodhousei*. WOODHOUSE'S JAY.— Seen occasionally at the G. O. S. Ranch.

30. *Corvus cryptoleucus*. WHITE-NECKED RAVEN.— A few ravens seen occasionally in different parts of the area, which, presumably, were of this race.

31. *Corvus brachyrhynchos hesperis*. WESTERN CROW.— A small flock observed Oct. 16, 1909, at the confluence of Beaver Creek and the Gila.

32. *Nucifraga columbiana*. CLARK'S NUTCRACKER.— One seen Oct. 23, 1910, at the G. O. S. Ranch.

33. *Cyanocephalus cyanocephalus*. PINE JAY.— Abundant over the entire area, especially about the lower streams.

34. *Xanthocephalus xanthocephalus*. YELLOW-HEADED BLACKBIRD.— Two seen at the G. O. S. Ranch, Oct. 9, 1911.

35. *Agelaius phoeniceus neutralis*. SAN DIEGO RED-WING.— Redwings in flocks about the G. O. S. Ranch, presumably of this race, all of each October.

36. *Sturnella neglecta*. WESTERN MEADOWLARK.— One seen Oct. 13, 1908, on Indian Creek, and one in Ring Canyon, Oct. 20, 1908.

37. *Euphagus cyanocephalus*. BREWER'S BLACKBIRD.— In flocks each year at the G. O. S. Ranch, and immediate vicinity. Latest date, Oct. 27, 1907.

38. *Pinicola enucleator montana*. ROCKY MOUNTAIN PINE GROSBEL.— Observed frequently all over the area, above 7000 feet, in Oct., 1907, and a few seen on Iron Creek, Oct. 20, and at the head of Rocky Canyon, Oct. 14, 1909.

39. *Carpodacus mexicanus frontalis*. HOUSE FINCH.— Noticed at the G. O. S. Ranch, Oct. 10, 1909, and Oct. 21 and 23, 1910.

40. *Loxia curvirostra stricklandi*. MEXICAN CROSSBILL.— Seen in moderate numbers all over the area, each October, above 7000 feet.

41. *Astragalinus tristis pallidus*. PALE GOLDFINCH.— One seen at the G. O. S. Ranch, Oct. 3, 1911.

42. *Astragalinus psaltria psaltria*. ARKANSAS GOLDFINCH.— Noted at the G. O. S. Ranch, Oct. 27, 1908.

43. *Spinus pinus*. PINE SISKIN.— A small flock seen at the G. O. S. Ranch, Oct. 8, 1908.

44. *Poecetes gramineus confinis*. WESTERN VESPER SPARROW.— One taken at the G. O. S. Ranch, Oct. 3, 1911.

45. *Zonotrichia leucophrys gambeli*. GAMBEL'S SPARROW.— Seen in large numbers at the Alum Camp, Oct. 6, 1907, and Oct. 21, 1908, and at the G. O. S. Ranch, Oct. 8, 1911.

46. *Zonotrichia coronata*. GOLDEN-CROWNED SPARROW.— One taken at the G. O. S. Ranch Oct. 8, 1911, and more noted at the same place all of the succeeding week.

47. *Spizella passerina arizonæ*. WESTERN CHIPPING SPARROW.— Several seen at the G. O. S. Ranch, Oct. 8, 1911.

48. *Passer domesticus*. ENGLISH SPARROW.— The local occurrence of this exotic furnishes a typical example of its advent and spread in a new location. There were none about the G. O. S. Ranch in October of 1906, 1907, or 1908, although it was common at Silver City (air line about 20 miles southwest) between which city and the Ranch, tower the Pinos Altos Mountains; and there were a few at the same time at Fort Bayard. In October, 1909, the writer saw a flock of eight at the G. O. S. Ranch (the first ever seen there): all but one of this flock were killed. In October, 1910, there was a larger flock at the G. O. S. Ranch, and in addition, the species was detected at the Lower G. O. S. Ranch, situate about nine (9) miles down the Sapello Creek. As many of these birds as possible were killed at this time. In October, 1911, there were a great many more seen at the G. O. S. Ranch, and the writer felt then that the species had succeeded in firmly establishing itself in the Sapello Valley. Fort Bayard is, in an air line, about fourteen (14) miles southerly from the G. O. S. Ranch, and there is a spur of the Pinos Altos Mountains intervening, the spur having an altitude of about 7700 feet — (there being 1600 feet difference in altitude between Fort Bayard and the top of this spur). It is doubtful that this sparrow would deliberately venture, in one effort, over this height and distance, since it would have to do so in a single stage, as it were, because there are practically no houses in the stretch of country between the two points. It is also somewhat improbable that the bird spread northwesterly from Silver City to the Gila, thence up the stream to the Sapello, and to the G. O. S. Ranch, as this would necessitate its going over territory practically uninhabited. The fact that it was detected at the G. O. S. Ranch before being noted at the Lower G. O. S. Ranch also militates against this idea. The most reasonable route by which the species probably spread is from Fort Bayard to Fierro, thence to the Mimbres River and across the Mimbres-Sapello Divide (altitude 6500 feet), and down the Sapello. An alternate route would be from Fort Bayard to Santa Rita, to Georgetown, the Mimbres Valley, and thence, as before, up the Mimbres. Both of these ways provide, all along, a number of farms, etc., at no excessive intervals, a condition which confessedly facilitates the spread of this bird. Yet the writer is by no means convinced that it did not come directly over the Pinos Altos Mountains, or its Eastern spurs, from the town of Pinos Altos (air line = 12 miles), or Fort Bayard (air line = 14 miles), or Fierro (air line = 10 miles), to the G. O. S. Ranch. The melancholy fact remains that this pest seems to have fixed itself permanently in the Sapello Valley.

49. *Junco hyemalis connectens*. SHUFFELDT'S JUNCO.— One taken at the G. O. S. Ranch, Oct. 9, 1910.

50. *Junco hyemalis mearnsi*. PINK-SIDED JUNCO.— Many seen on each trip over all the region. Earliest date, Oct. 16, 1907, and the latest date, Oct. 21, 1907.

51. *Junco hyemalis annectens*. RIDGWAY'S JUNCO.—A number seen at the G. O. S. Ranch, Oct. 13, 1907.
52. *Junco phæonotus dorsalis*. RED-BACKED JUNCO.—Seen in considerable numbers over the entire area, each trip. Earliest date, Oct. 5, 1908, and the latest, Oct. 17, 1908.
53. *Amphispiza nevadensis nevadensis*. SAGE SPARROW.—One taken at the G. O. S. Ranch, Oct. 7, 1911.
54. *Pipilo maculatus montanus*. SPURRED TOWHEE.—One taken at the G. O. S. Ranch, Oct. 7, 1911.
55. *Pipilo fuscus mesoleucus*. CAÑON TOWHEE.—Common at the G. O. S. Ranch each October. Latest record, Oct. 29, 1907.
56. *Oreospiza chlorura*. GREEN-TAILED TOWHEE.—Noted at the G. O. S. Ranch, Oct. 22, 1910.
57. *Petrochelidon lunifrons lunifrons*. CLIFF SWALLOW.—Seen at the junction of Beaver Creek and the Gila, Oct. 16, 1909.
58. *Hirundo erythrogastra*. BARN SWALLOW.—Noted at the G. O. S. Ranch, Oct. 13, 1907.
59. *Dendroica auduboni auduboni*. AUDUBON'S WARBLER.—Noted at the G. O. S. Ranch, Oct. 22, 1910, and Oct. 8, 1911.
60. *Cinclus mexicanus unicolor*. WATER OUSEL.—A pair seen Oct. 16, 1908, on the upper reaches of the West Fork of the Gila, and one seen Oct. 19, 1909, at the junction of the Middle Fork of the Gila and Iron Creek.
61. *Salpinctus obsoletus obsoletus*. ROCK WREN.—Seen each trip along the larger streams, the latest on Black Canyon, Oct. 15, 1909.
62. *Catherpes mexicanus conspersus*. CAÑON WREN.—One taken on the West Fork of the Gila, Oct. 27, 1909.
63. *Certhia familiaris montana*. ROCKY MOUNTAIN CREEPER.—Seen in 1906, and in 1910, in various localities in the area, latest date being Oct. 19, 1910.
64. *Sitta carolinensis nelsoni*. ROCKY MOUNTAIN NUTHATCH.—Common throughout the entire area.
65. *Sitta canadensis*. RED-BREADED NUTHATCH.—One taken at the G. O. S. Ranch, Oct. 19, 1910.
66. *Sitta pygmaea pygmaea*. PYGMY NUTHATCH.—Seen over the area in all parts visited, throughout the entire month of October.
67. *Baeolophus wollweberi*. BRIDLED TITMOUSE.—One taken at the G. O. S. Ranch, Oct. 19, 1910.
68. *Pentsthes gambeli gambeli*. MOUNTAIN CHICKADEE.—Common over the entire area.
69. *Regulus calendula calendula*. RUBY-CROWNED KINGLET.—One taken in Black Range, Oct. 5, 1909, on head of Black Canyon.
70. *Polioptila caerulea obscura*. WESTERN GNATCATCHER.—A small flock seen Oct. 29, 1909, on Sapello-Gila Divide just above Alum Camp.
71. *Myadestes townsendi*. TOWNSEND'S SOLITAIRE.—One seen on Clear Creek, Oct. 21, 1909.

72. *Hylocichla guttata auduboni*. AUDUBON'S HERMIT THRUSH.— Two taken in Rocky Canyon, Oct. 11, 1906.

73. *Hylocichla guttata nanus*. DWARF HERMIT THRUSH.— One taken on the Mimbres — Black Canyon Divide, Oct. 5, 1908.

74. *Planesticus migratorius propinquus*. WESTERN ROBIN.— Common over all the area, but not noted above 8000 feet.

75. *Sialia mexicana bairdi*. CHESTNUT-BACKED BLUEBIRD.— A number seen at the Alum Camp Oct. 16, 1907.

76. *Sialia currucoides*. MOUNTAIN BLUEBIRD.— Common over all the area, latest date being Oct. 17, 1908.

THE HAWAIIAN LINNET, *CARPODACUS MUTANS* GRINNELL.

BY JOHN C. PHILLIPS.

IN 'The Auk' for June, 1912, Mr. Grinnell gives a new name to the introduced linnet of the Hawaiian Isles. I propose to discuss briefly both the name itself and the specific value of the form named.

In the first place, the word itself, *mutans*, implies a very definite condition, namely, a sudden germinal variation expressed in the soma as a Mendelian dominant, dominant because it is not possible to conceive of a recessive character, getting the upper hand in the wild unless it is of marked selectional value.

The word mutation means "the act or process of changing" but in the biological sense which it has had since the time of de Vries, a very definite meaning has been given to it, often theoretical perhaps, but nevertheless quite clear. Unfortunately the word has been misapplied to little understood types of variation,— for instance, to rare Mendelian combinations, to the loss of one or more characters from the germ cells, to the products of disease, etc., etc.

The name *Carpodacus mutans*, then, would imply that the following experimental conditions must hold. First the new form must breed true, or as true as the old, even when taken back to its original continental range. Second, in crosses with typical orange

birds of ancestral stocks, it must behave as a dominant, or at least as a partial dominant. Neither of the above premises is likely to hold good.

Now as to the value of these imported Hawaiian Linnets in a racial sense. Mr. Grinnell discusses the change in caged Linnets (University of Cal. Pub., Vol. 7, p. 179) and shows that yellow birds result from red, after a short period of confinement. This appears to be a well known fact with various red birds. The case of the European Linnet is mentioned by Finn in the Avicultural Magazine for June, 1906. Mr. Bangs informs me of like cases from his own experience with Crossbills, Redpolls and Purple Finches and with a Cardinal in confinement. The Cardinal did not go so far off color as the Crossbills. The so-called Japanese Robin (*Liothrix luteus*) which is brilliantly colored on the chest, throat, and primaries with orange and scarlet-vermilion, turns more or less olivaceous all over after a few moults according to Mr. Bang's experience. We have all seen the dirty white color which American Flamingoes take on in zoölogical gardens.

Is it not thus highly probable, as Mr. Grinnell himself has suggested, that a diminished tyrosine oxidation is responsible for both the caged and the Hawaiian birds. The general environmental complex of the Hawaiian Islands is an intricate problem, but the fact that other American insular areas, Guadalupe and San Benito Islands, show a rather high percentage of yellow or orange birds is suggestive as Mr. Grinnell says of some special insular effects. The occurrence of *some* yellow or orange birds (percent hard to estimate for reasons given Mr. Grinnell on p. 182) in the normal habitat of the species, shows that its color elaborator is in a state of delicate adjustment, that is, it is not always allowed to continue its action up to the ultimate crimson color. We can well imagine, then, that a very slight diminution in the activity of the enzyme might produce the observed results in Hawaii, and might not these results be of entirely extrinsic origin? It is certainly easier to apply a theory of this sort than to hunt about for a deeper one.

On page 184 Mr. Grinnell calls attention to the fact that eight or ten years ago there were many red or crimson linnets in the islands. The data upon which this suggestion is founded are not quite

sufficient for the purpose, but if this is so there has been a change since that time, and the case is a very curious one.

In the Museum of Comparative Zoölogy there is a series of twelve male and six female Linnets collected by Flood Bros. on Molokai in 1895 fifteen years before Mr. Grinnell's series was taken by Miss Alexander on Molokai, Oahu and Maui. This series shows (provided it was taken at random) that the species was at that time nowhere near stability, and that there was almost as great a range of color as in birds from Arizona and other parts of the southwest, only the average color is of a much lighter shade. Three of the males are poppy red to orange vermillion (Ridgway's Manual of Colors, 1886), three of them are orange to orange vermillion, five are orange to cadmium-orange, and one is pure cadmium yellow. In most of these birds the feathers are of mixed tints, that is, at least two colors occur on one bird. Most of these birds, then, are well off color. There is no individual of the deep crimson type. As a whole this series does not differ very markedly from Mr. Grinnell's as far as one can judge without comparison. The colors, being so subtle and mixed are not easily described.

In the last paragraph of his paper Mr. Grinnell says that at the present time "to assert emphatically any particular factor or group of factors as the prime stimulus does not seem justifiable." The name however, *C. mutans*, does assert or at least imply a definite variation of an intrinsic, or germinal nature. The question as to whether this slight alteration in a character already unstable is deserving of special recognition in our nomenclature is an open one, and certainly not for the writer to decide. It was the name itself which first appeared to him as inappropriate.

THE INTRODUCTION AND ACCLIMATIZATION OF THE
YELLOW CANARY ON MIDWAY ISLAND.

BY WILLIAM ALANSON BRYAN.

WE are accustomed to look on the common Yellow Canary (*Fringilla canaria*) and the numerous varieties that have been artificially produced from it as a cage bird pure and simple. It is the belief of many that through centuries of confinement and domestication they have lost the power to sustaining themselves should they be given their liberty and forced to shift for themselves in the open. It is urged that through hundreds of generations they have become so modified and adapted to cage environment that liberty means nothing to them and that they must perish miserably before they would be able to adapt themselves to the conditions existing in the larger and freer world of which they see and know so little.

It is a matter of considerable satisfaction therefore to be able to lay before the readers of 'The Auk' some of the facts kindly supplied me by Mr. D. Morrison, through the courtesy of Captain Piltz touching on the liberation and subsequent acclimatization and establishment of a colony of yellow canaries on the little low isolated island of Midway.

For the benefit of those who may never have heard of Midway, it may be well to state that the Hawaiian group as a matter of convenience has been divided into the Windward or inhabited islands and the Leeward or uninhabited chain. Midway belongs to this latter division of the group and save Ocean Island, it is the farthest removed from Oahu of the list of small low islands that stretch away from Honolulu towards Japan in a northwesterly direction. It is something over 1000 miles distant from Honolulu and as its name implies it is near the geographical center of the North Pacific for which reason it is now used as a relay station for the Commercial Pacific Cable Company's wire across this great ocean.

As a matter of fact Midway is made up of two small patches of sand known as Eastern and Sand Islands. These islets are sur-

rounded by a narrow circular reef six miles in diameter. Sand, the larger of the two, is now occupied by the cable station and the comfortable quarters established by the company. The buildings are surrounded by a number of introduced trees and shrubs, but at the time of my visit in 1902, an account of which I have elsewhere published,¹ it was an uninhabited shimmering white pile of sand on which during my short stay I was able to collect only six species of littoral plants. From the nearby Eastern islet I was able to secure ten species of grasses, vines and low growing shrubs, — species that are common on the coral islands in the group.

For the ornithologist, interest ordinarily centers about the great colony of countless thousands of sea birds that represent the dozen or more species making the island their home. But for the present we are especially concerned with the birds that have been introduced on Midway and particularly with the establishment of the Yellow Canary there. I therefore quote from the letter written me December 15th, 1911, by Mr. D. Morrison who for a number of years has been the superintendent in charge on the island in reply to my request for the data concerning the acclimatization of the "Song-birds" on Midway.

"I assure you that it is a pleasure to learn of your interest in the matter and I am only too willing to furnish you with the particulars which you are at liberty to make whatever use of you wish.

"YELLOW CANARIES (called by us Canton Canaries):— In March, 1909, I purchased a pair of these birds from the crew of the S. S. Siberia in Honolulu harbour. They had a number of them in the fore-castle which were to be sold for whatever they would bring upon arrival at San Francisco. I brought them to Midway Island in separate cages at the end of the same month. They were put together in a breeding cage in January 1910 and the female started with five eggs none of which hatched out.

"A month later she laid seven eggs out of which six healthy birds were hatched.

"In April she laid six eggs and hatched out four birds.

"Some weeks later seven eggs were laid none of which hatched out.

¹ Report of a Visit to Midway Island by Wm. Alanson Bryan. Occas. Papers B. P. Bishop Mus., Vol. II, No. 4, pp. 37-45.

"These eleven young birds were kept in large cages until July of the same year on account of a number of very troublesome cats which were living in a wild state amongst the shrubbery. They were wary and extremely difficult to kill. One of our Chinese servants devised a large frame trap of chicken netting, with partitioned compartments (parlour and bedroom we called it) with a drop door at each end attached by string to the bait. This was successful and in May, 1910, we were sure that there were no cats left on the Island.

"In July two male canaries were sent me from Honolulu and these along with the eleven young birds which we had raised here were liberated. For a time the young birds would return to the doors at night to be taken in but they quickly became accustomed to their liberty.

"In December they began nesting. One built in a slender and very exposed Australian Ironwood tree (introduced) close to the buildings and hatched out three healthy looking birds but they perished during a gale with a very low temperature on the night of January 13th, 1911, and the nest was abandoned. Shortly afterwards we discovered that well sheltered nests were being built in the heart of clumps of "Marianne" grass and young birds soon made their appearance at the feed boxes which we have attached to veranda railings. New batches came at intervals up to the month of August.

"We estimate the offspring for the season to be about 60, and at the present time (December, 1911) mating has begun, and with fairly favourable weather conditions we have every reason to expect a large increase during this season.

"They are beautiful songsters and most attractive, and although not quite so friendly as the Laysan Finch (*Telespiza cantans*) they will feed with a person standing within a yard of them. During the spring of 1911 the original pair were put together but from several batches of eggs no birds were obtained.

"THE LAYSAN FINCH": In May, 1905, I happened to be at Laysan Island on the "Iroquois" and procured from Mr. Max Sclimmer a cage of these birds. They were liberated upon arrival here but were only seen around the buildings for a week or two. Another cage of these birds was secured at Laysan by Capt. Piltz and sent here to Mrs. Colley in September of the same year (1905). They

were liberated on Eastern Island, as we believed it useless to try to domesticate them here on account of the cats. They increased rapidly over there and in January, 1910, we brought over a number of them as well as a large cage full of "Wingless" birds (*Prozanula palmeri*), but still having cats with us I fear a good many of this importation was destroyed. In May another lot of Finches and Wingless birds was taken over and both of these have increased remarkably and have been found most useful in keeping vegetation free from destructive caterpillars.

"You are more familiar with the history of the Laysan birds than I am and probably known how the Finch and Wingless bird were introduced there. I have heard that Captain Walker's crew brought Wingless birds from Laysan to Eastern Island in 1887. But the canaries and Finches were established on this island as herein related. They appear to be finding a good deal of food amongst the vegetation which has recently been established over the north end of the Island, but we still continue to keep the feed boxes well filled with mixed bird seed, and to distribute dishes with fresh water around the verandas. The yellow birds enjoy their daily bath but the Laysan Finch does not bathe.

"I shall be glad to furnish you with any further particulars regarding the birds or their progress at any time.

"Yours very truly,

"D. MORRISON,

"Superintendent, Midway."

Under date of March 11th, Mr. Morrison again writes me from Midway that he is exporting to New York on that date fourteen young Canaries of this season's hatch, two of the 1911 hatch, and the male of the original pair that was carried to Midway in 1909. The female bird of the parent stock is still retained on the island. The young birds were all hatched in the open but the old male bird had never been at liberty.

With these facts before us I venture to say that the future of this colony of Yellow Canaries will be followed by those who are interested in the introduction and naturalization of song and game birds since it furnishes an excellent example of a species returning to its natural wild habits in an inhospitable environment after centuries of confinement and artificial breeding and feeding.

EARLY RECORDS OF THE CAROLINA PAROQUET.

BY ALBERT HAZEN WRIGHT.

ALMOST our only ornithologic sources of the earlier times in North America are historical annals, quaint narratives of exploration, and travellers' sketches. In those days, the number of *real* naturalists may have been many, yet they seldom recorded their observations in scientific form; and our resident scientists were few. Hence, if we would form any idea of the primitive conditions and species, we must perforce use what we have at hand, however diverse our respective evaluations of their trustworthiness. The average biologist, as he reads early North American travels, cannot but marvel at the intense interest of our predecessors in birds, now rare, near-extinct or extinct. The flocking of the Passenger Pigeon, the size and flavor of the Wild Turkey, the gorgeous plumage and surprising northern range of the Carolina Paroquet, or equally peculiar characters or habits of other forms, now fast disappearing, were in such bold relief, so obvious and so patent as to attract the attention of any layman whatever his mission.

Probably none of these forms caused more genuine amazement than the Paroquet (*Conuropsis carolinensis*), particularly in the northern limits of its range. Of its previous distribution, Hasbrouck in his monograph of this form says,¹ "we find that of the forty-four States and five Territories comprising our country, there are records of the occurrence of this species in twenty-two States and one Territory, over which it formerly ranged. If we take the forty-third parallel as the northern limit, the twenty-sixth as the most southern, the seventy-third and one hundred and sixth meridians as the eastern and western boundaries respectively, we will have included very nearly all the country in which the Paroquet formerly lived." In his introductory remarks he notes that "For many years it has been a recognized fact that the Carolina Paroquet (*Conurus carolinensis*) is fast approaching extermination, the last quarter of a century having witnessed such rapid diminution in its numbers and so great a restriction in its range that, 'in the opinion

¹ 'The Auk', Vol. VIII, No. 4, Oct., 1891, pp. 371, 369.

of the best judges, twenty years hence it will be known only in history and from museum specimens." Has the prophecy been fulfilled? Just previous to this communication (1888-1889) Chapman records ¹ it in Eastern Florida, and reports more or less authentic indicate its presence in Oklahoma. Two years later (1891) Merriam gives ² an isolated record of it in Southern Missouri, and Wayne ³ and Scott ⁴ record it from North and South Florida respectively. The last apparent notice of this form in the flesh is that of Chapman ⁵ for 1904 when he finds it still present about Lake Okeechabee, Florida.

In this state, the first records begin in 1587, when Laudonniere in "The Description of the West Indies in generall, but chiefly and particularly of Florida" says, ⁶ "The foules are Turkeycocks, Partridges, Parrots" Four years preceding (1583), Sir George Peckham in "A true Report of the late discoveries — of the New-found Lands, By that valiant and worthy Gentleman Sir Humfrey Gilbert," holds that explorers in North America ⁷ "doe testifie that they have found in those countryes . . . ; Parrots." About the same time (1587), Thomas Hariot in speaking "Of Foule" of Virginia, writes, ⁸ "There are also Parrots . . . , which although with us they be not used for meat, yet for other causes I thought good to mention." The final note of the sixteenth century comes in Daniel Coxe's Carolana (Louisiana). He sent his first expedition up the Mississippi in 1598. He finds ⁹ "great companies of turkeys, . . . parrots, and many other sorts of curious birds differing from ours."

The roll of records for the seventeenth century begins with Captain John Smith who finds (1607-1609) in Virginia that ¹⁰ "In

¹ Proc. Linnaean Soc. of New York, 1890, pp. 4-6.

² 'The Auk', Vol. IX, p. 301.

³ *Ibid.*, Vol. XII, p. 367.

⁴ *Ibid.*, IX, p. 218.

⁵ Bird-Lore, Vol. VI, No. 3, June 1, 1904, p. 103.

⁶ Hakluyt, Richard. *The Principal Navigations, Voyages, Traffiques and Discoveries of the English Nation.* Hakluyt Soc. Extra Series, Vol. XVIII, p. 451. Glasgow, 1904.

⁷ *Ibid.*, p. 115.

⁸ *Ibid.*, pp. 369, 370.

⁹ Hist. Colls. of Louisiana. By B. F. French. Part II, Phila., 1850, p. 261.

¹⁰ Smith, Capt. John, etc., *Works of, 1608-1631.* Edited by Edward Arber, 1884, p. 60.

Winter there are great plenty of . . . Parrats, . . .". About the same time Wm. Strachey's curious "Histoire of Travaile into Virginia" (1610?-1612?) appears. Of the "Parakitoes," he writes,¹ "I have seene manie in the winter, and knowe divers killed, yet be they a fowle most swift of wing, their winges and breasts are of a greenish cullour, with forked tayles, their heads, some crymsen, some yellowe, some orange-tawny, very beautifull. Some of our colonie who have seene of the East Indian parratts, affirme how they are like to that kynd, which hath given us somewhat the more hope of the nerenes of the South Sea, these parratts, by all probability, like enough to come from some of the countryes upon that sea." In 1615, Ralph Hamor in the same region observes² "in winter about Christmas many flocks of *Parakertoths*."

The same year, 1615, Champlain, when just north of Lake Ontario,³ "lost (his) way in the woods, having followed a certain bird that seemed to (him) peculiar. It had a beak like that of a parrot, and was of the size of a hen. It was entirely yellow except the head which was red, and the wings which were blue, and it flew by intervals like a partridge. The desire to kill it led (him) to pursue it from tree to tree for a very long time, until it flew away in good earnest," — a description which might suggest the paroquet. It is much later, 1649, in "A Perfect Description of Virginia" that "Parrots" next appear.⁴ The Jesuit Relations yield four short notes. The Relations of 1661-62 in speaking of Kentucky or Tennessee, observe that in the fruit trees,⁵ "birds of all colors and of every note, especially little Paroquets, which are so numerous that we have seen some of our Iroquois return from those countries with scarfs and belts which they had made from these birds by a process of interweaving," Some ten years later (1673) Dablon finds, on the lower Mississippi, that⁶ "Parroquets fly in flocks of 10 to 12." Finally, the "Voyages du P. Jacques Mar-

¹ Hakluyt Soc., London, 1849, p. 126.

² Hamor, Ralph. *A True Discourse of the Present Estate of Virginia, etc.* London, 1615. Reprint, Richmond, 1860, p. 21.

³ Champlain, *Voyages of, 1611-1618*. Vol. 3. Prince Soc. Publications, Vol. 13, 1882, p. 140.

⁴ Mass. Hist. Soc. Coll. Second Ser., Vol. IX, 1822, p. 121.

⁵ Jesuit Relations and Allied Documents. By R. G. Thwaites and others, 1896, Vol. 47, p. 147.

⁶ *ibid.*, Vol. 58, p. 99.

quette" (1673-1677) mentions this form in two places. Of his experiences on the Mississippi near the mouth of St. Francis River in Arkansas, we read,¹ "We killed a little parroquet, one half of whose head was red, The other half and The neck yellow, and The whole body green." The other quotation speaks of the Mississippi at the 38th degree of latitude.⁴ "We have seen nothing like this river that we enter, as regards its fertility of soil, its prairies and woods; its . . . parroquets, . . ."

In 1663 some "Commissioners sent from Barbodes to explore the River Cape Fear," report,² "in the woods, great flocks of paroquitos," as does William Hilton in the same region the succeeding year (1664). He writes that³ "in that time as our business called us up and down the River and Branches, we kill'd . . . three dozen of Parrakeeto's." About 1677, Rev. Andrew White in "A Relation of the Colony of Lord Baron of Baltimore, in Maryland, near Virginia, etc." records,⁴ that "During the winter it abounds in . . . parrots, and many others unknown to our parts of the world." Five years later (1682) both Samuel Wilson and T. Ashe note this species in Carolina. The former says,⁵ "Here are also in the woods, great plenty of . . . Paraquetos"; the latter finds the⁶ "Birds for Food, and pleasure of Game, are . . . and Parakeittoes." Two years before the end of the century, L. Hennepin when at the Head of the Illinois River, observes,⁶ "Parrots" "in that country," and then again along the Mississippi where⁶ "The Country affords all sorts of Game, as . . . Parrots, . . ."

In the eighteenth century the number of records exceeds those of the two preceding centuries combined. Almost at its beginning (1702), Holm in "A Short Description of the Province of New Sweden," notes,⁷ "Parrats." In 1714 the celebrated Lawson

¹ *ibid.*, Vol. 59, pp. 149-151, 161.

² Hawks, Francis L. *History of North Carolina*. Fayetteville, N. C., Vol. II, 1858, p. 31.

³ Hilton, Wm. *A Relation of a Discovery lately made on the coast of Florida*, etc. Force, Peter. *Tracts and Other Papers*. Wash., D. C., Vol. IV, 1846, p. 15.

⁴ Force, Peter. *ibid.*, Vol. IV, 1846, p. 7.

⁵ Carroll, B. R. *Hist. Colls. S. C.* New York, 1836, Vol. II, pp. 28, 73.

⁶ Hennepin, L. *A New Discovery of a Vast Country in America*. London, 1698, pp. 93, 94.

⁷ *Mem. Hist. Soc. Penn.*, Vol. III, p. 41 (Part I).

speaks of this form in three different places. In the first place he gives the statement of Hilton (1664) above; the second is to include it in his list of "Birds of Carolina"; and the last note characterizes it as follows:¹ "The parrakeetos are of a green color, and orange colored half way their head. Of these and the alligators, there is none found to the northward of this province. They visit us first when mulberries are ripe, which fruit they love extremely. They peck the apples to eat the kernels, so that the fruit rots and perishes. They are mischievous to orchards. They are often taken alive and will become familiar and tame in two days. They have their nests in hollow trees, in low swampy ground. They devour the birch buds in April, and lie hidden when the weather is frosty and hard."

Following Lawson comes William Byrd who discusses (1729) it in connection with apple growing² "The Truth is, there is one Inconvenience that easily discourages lazy People from making This improvement: very often, in Autumn, when the Apples begin to ripen, they are visited with numerous flight of paraqueets, that bite all the Fruit to pieces in a moment for the sake of the kernels. The Havock they make is Sometimes so great, that whole Orchards are laid waste in Spite of all the Noises that can be made, or Mawkins that can be dresst up, to fright 'em away. These Ravenous Birds visit North Carolina only during the warm Season, and so soon as the Cold begins to come on, retire back towards the Sun. They rarely Venture so far north as Virginia, except in a very hot Summer, when they visit the most Southern Parts of it. They are very Beautiful; but like some other pretty Creatures, are apt to be loud and mischievous." In 1734 Mr. Commissary Von Reck, who "conducted the First Transport of Saltzburgers to Georgia," writes (Apr. 22) that when at Ebenezeer on Savannah River,³ "Parrots and Partridges make us here a very good Dish." In the "History and General Description of New France" 1744, Charlevoix merely mentions⁴ "Parrots" in Florida.

¹ Lawson, John. *The History of Carolina, etc.* London, 1714. Reprinted, Raleigh, 1860, pp. 125, 222, 234.

² Byrd, William. *History of the Dividing Line and Other Tracts.* Richmond, 1866, Vol. I, p. 58.

³ Force, Peter. *ibid.*, p. 12.

⁴ Shea, J. G. *Translation of.* New York, 1866, Vol. I, p. 140.

In another quarter (Louisiana), the memoirs of M. Dumont (1753) finds ¹ "The paroquets are very common . . . , where they are about the size of a pigeon and of one color decidedly green. The head is very large, and the beak is like all the other birds of their sort, except it is bordered on both sides entirely to the top of the head by a sort of bow of yellowish color mixed with a little very brilliant red plume, less red in the females than the males. These birds fly ordinarily in flocks of eighteen or twenty; and when they pass in rapid flight, they utter screams loud enough to deafen the ears. When they are shot and eaten, the flesh is dark. When they are eating the seed of those *appe mace* of which I have spoken and of which I have said that they are very fond, if after having killed them one gives the refuse to cats, it kills them. "In the Ohio River region, John Jennings in his "Journal from Fort Pitt to Fort Chartes in the Illinois Country" ² on March 13, 1766, "saw several Parrotkites" at Little Tottery Creek; the day following at Scioto River, "saw some parotkites"; on great Mineami River, "saw several flocks of Parrotkites"; and lastly, on the Mississippi just above the Ohio River's mouth, recorded the same. In 1766-1768 Carver finds ³ "Parrots" in the interior parts of North America. In 1772-1773 Rev. David Jones says ⁴ that as you approach the Ohio River region from the east, "after you go near the Great Kanawha, large flocks of small green parrots are to be seen."

"The Parroquet of Louisiana," M. LePage DuPratz thinks ⁵ "is not quite so large as those that are usually brought to France. Its plumage is usually of a fine sea-green, with a pale rose-coloured spot upon the crown, which brightens into red towards the beak, and fades off into green towards the body. It is, with difficulty that it learns to speak, and even then it rarely practices it, resembling in this the natives themselves, who speak little. As a silent parrot would never make its fortune among our French

¹ *Memoires Historiques Sur La Louisiane*. Paris, 1753. Tome Premier. p. 87.

² *Penn. Mag. of Hist. and Biography*. Vol. 31, 1907, pp. 146, 147, 148, 152.

³ Carver, J. *Travels through the Interior Parts of North America, in the Years 1766, 1767, and 1768*. London, 1778, p. 466.

⁴ Jones, Horatio G. *Journal of Rev. David Jones*. In *Cincinnati Miscellany*, by Chas. Cist. Vol. II, p. 232.

⁵ DuPratz, M. Le Page. *The History of Louisiana*. London edit. 1774, p. 278.

ladies, it is doubtless on this account that we see so few of these in France." Following DuPratz, are three short notices. In 1776, "The History of North America" (London, 1776, p. 251), "With regard to the winged species" of Florida, remarks, "Here are vast numbers of . . . , parrots, In his Notes written in 1781, Jefferson merely mentions ¹ "*Psittacus Carolinensis*. The Parrot of Carolina. Perroquet." in one place; in the other, it is only incidentally that he speaks of it. In speaking of the climate of the Mississippi valley, he says, ¹ "if we may believe travellers, it becomes warmer there than it is in the same latitude on the sea side. Their testimony is strengthened by the vegetables and animals which subsist and multiply there naturally, and do not on our coast. . . . Perroquets even winter on the Sciota, in the 39th degree of latitude." Three years later, 1784, John Filson just notes ² "the perroquet, a bird every way resembling a parrot but much smaller";

In 1791, William Bartram writes of it at considerable length. While speaking of *Cupressus disticha* (Cypress), he says, ³ "Paroquets are commonly seen hovering and fluttering on their tops: they delight to shell the balls, its seed being their favorite food." In his list of birds, he gives "*Psittacus Caroliniensis*, the parrot of Carolina or parakeet." "These are natives of Carolina and Florida where they breed and continue the year round." "The parakeet (*psiticus caroliniensis*) never reach so far North as Pennsylvania, which to me is unaccountable, considering they are a bird of such singular rapid flight, they could easily perform the journey in ten or twelve hours from North Carolina, where they are very numerous, and we abound with all the fruits which they delight in."

"I was assured in Carolina, that these birds, for a month or two in the coldest winter weather, house themselves in hollow Cypress trees, clinging fast to each other like bees in a hive, where they continue in a torpid state until the warmth of the returning spring reanimates them, when they issue forth from their late dark, cold

¹ Jefferson, Thomas. Notes of the State of Virginia, 1825, p. 97, 107.

² Filson, John. The Discovery, Settlement and present State of Kentucky, etc. Wilmington, 1784, p. 26.

³ Bartram, William. Travels through North and South Carolina, Georgia, East and West Florida, etc. Phila., 1791, pp. 91, 92, 289, 290, 301.

winter cloisters. But I lived several years in North Carolina and never was witness to an instance of it, yet I do not at all doubt but there have been instances of belated flocks thus forced into such shelter, and the extraordinary severity and perseverance of the season might have benumbed them into a torpid sleepy state; but that they all willingly should yield to so disagreeable and hazardous a situation, does not seem reasonable or natural, when we consider that they are a bird of the swiftest flight and impatient of severe cold. They are easily tamed, when they become docile and familiar, but never learn to imitate the human language."

Before the end of the century, several travellers in quick succession furnish items of interest. In the reminiscences of O. M. Spencer of Hamilton Co., Ohio, we read that ¹ "In April (1792) . . . Flock of parraquets were seen, decked in their rich plumage of green and gold." The same year, John Heckewelder in his journey to the Wabash when he arrives at its mouth, finds ² "The noise of the many paroquets (a small kind of parrot) was dreadful and not attuned to (his) ears." In 1793, Imlay only lists the ³ "Perroquet" with its Linnæan designation, "Psittacus." In 1794, Loskiel (thinking primarily of the Ohio region) writes, ⁴ "A few green Parrots (psittacus) are seen in the woods in summer, but are in greater numbers further to the south." In the Mississippi valley, Jan. 1, 1796, André Michaux when at Little River, enumerates among the ⁵ "Birds: . . . ; green Parroquets with yellow heads of the small species; . . ." At the end of this century or the beginning of the next, John Davis, on a journey from Charleston, S. C., to Coosahatchie in one of many shooting excursions in the woods, writes, ⁶ "once we brought down some paroquets that were directing their course over our heads to *Georgia*."

¹ Howe, Henry Hist. Colls. of Ohio. 2nd edit. Cincinnati, 1847, p. 230.

² Penn. Mag. of Hist. and Biog. Vol. XII, p. 166.

³ Imlay, George. A Topographical Description of the Western Territory of North America, etc. 2nd edit. London, 1793, p. 237.

⁴ Loskiel, George Henry. History of the Mission of the United Brethren among the Indians in North America. In three parts. Transl. by C. I. La Trobe. London, 1794 (original 1788), p. 92.

⁵ Early Western Travels, 1748-1846. Edited by R. G. Thwaites. Cleveland, O., 1904, Vol. III, p. 83.

⁶ Davis, John. Travels of Four Years and a Half in the United States of America during 1798, 1799, 1800, 1801, and 1802. London, 1803, N. Y. edit., by A. J. Morrison, 1909, p. 91.

In the earlier half of the nineteenth century many of the travelers in North America record the presence of the paroquet. Capt. Matthew Phelps when "Among the wild fowl" of the Mississippi River, says,¹ "I observed . . . paroquets . . ." At Christmas camp, Dec. 25, 1806, near Brown Canon, Colo. (near source of Arkansas river, and 7 miles above Salida which is also above the Grand Canon of the Arkansas) Capt. Zebulon M. Pike² "Caught a bird of a new species (*Conurus carolinensis*) having made a trap for him. This bird is of a green color, almost the size of a quail, had a small tuft on its head like a pheasant, and was of a carnivorous species; it differed from any bird we ever saw in the United States. We kept him with us in a small wicker cage, feeding him on meat, until I left the interpreter on the Arkansas, with whom I left it. We at one time took a companion of the same species and put them in the same cage, when the first resident never ceased attacking the stranger until he killed him." The same year, Priscilla Wakefield (at St. Juans, Florida) in discussing the cypress where the eagles fix their nests, notes that³ "paroquets, venture to approach the royal bird, and often perch on these inaccessible branches. The paroquets are allured by the seeds which are their favorite repast." In 1807 George Heriot claims⁴ that "parrots" are of "the birds of the southern parts of Canada," and that "The northern parts of Canada are visited in the milder seasons by . . . , parrots, . . ." The following year, the Travels of the hated Thomas Ashe come out. When on a trip to the Great Miami, he records the paroquet but at the end of his note shows his exaggerative skill. He says,⁵ "During the repast I was entertained by the chattering of a flock of paroquets, who had taken up their abode in the trees around me. They were the green and the red neck, that very particular species which are held the most

¹ Phelps, Capt. Matthew. *Memoirs and Adventures of*. By Anthony Haswell. Bennington, Vt., 1802, p. 55 (Appendix).

² Pike, Zebulon Montgomery. *The Expeditions of, During the Years 1805-6-7*. New edit. by Elliot Coues. 3 vols. N. Y. 1895, Vol. II, p. 474.

³ Wakefield, Priscilla. *Excursions in North America, etc.* London, 1806, p. 95.

⁴ Heriot, George. *Travels through the Canadas, etc.* London, 1807, pp. 516, 517.

⁵ Ashe, Thomas. *Travels in America Performed in 1806, etc.* London, 1808, p. 224.

rare in Europe, and which were once highly valued by the Greeks and Romans."

In 1810 we have two references. Schultz at New Orleans writes that ¹ "Those (birds) which may be considered as local are, . . . paroquets, . . ." These "Parroquets are so well known to you that any description of them would be unnecessary. One good quality they possess with which you are perhaps unacquainted: a dozen of them make a most delicious sea-pie." The other note of this year, comes when Cuming opposite Portsmouth (Ohio) on the Virginia side,² "observed here, vast numbers of beautiful large green paroquets, which our landlord, squire Brown, informed us abound all over the country. They keep in *flocks*, and when they alight on a tree, they are not distinguishable from the foliage, from their colour."

The next decade furnishes at least eight different writers who remark of the paroquet. The first, David Thomas, a botanist and later engineer in the construction of the western division of the Erie Canal gives it more attention than any other North American bird. He writes of his first acquaintance with this form as follows:³ "As we approached the banks of *Indian Kentucky*, hearing shrill screams over our heads, we looked up, and first saw the paroquet. These birds, which are about the size of wild pigeons, are sometimes seen on the Miami." In a footnote he gives, "Drake says on the Sciota." When near Lost River and Lick Creek, Ohio, he says, "The paroquet commits depredations on the wheat in harvest, but it is a bird of uncommon beauty. The head is red, the neck yellow, and the body a light green." At French Licks (sulphur springs with salt in them) he finds, "This place is the favorite residence of the paroquet, flocks of which were continually flying round. These birds seem to delight in screaming." At Vincennes, Ind., he remarks of their association with cottonwoods. "A small cotton wood tree stands opposite to the window where I am writing, dark excrescences on its branches like those which appear on

¹ Schultz, Christian. *Travels on an Inland Voyage through the States of New York, Pennsylvania, Virginia, Ohio, Kentucky and Tennessee, etc.* New York. 2 vols. 1810 pp. 182, 184, 185.

² Cuming, F. *Sketches of a Tour to the Western Country, through the States of Ohio and Kentucky; etc.* Pittsburgh, 1810, p. 141.

³ Thomas, David. *Travels through the Western Country in the Summer of 1816, etc.* Auburn, N. Y. 1819, pp. 115, 133, 135, 160, 210, 307.

this species in the western parts of New York. It is well known that these blemishes are produced by the irritation of insects;—first by a puncture when the egg is deposited, and afterwards by the growth and motion of the worm. To procure this food, the *parroquets* have been busily employed, at times, through the day: but though they have become so familiar; and though they excel all the birds of this country in beauty of plumage,—their scream is so discordant, and their fierceness of disposition so apparent, as to preclude every sensation of attachment. These birds build their nests in hollow trees. The strength of their necks is remarkable; and we are assured that when both wings and feet are tied they can climb trees by striking their bills into the bark.” In the Wabash region, he observes that, “On the approach of any large bird the *Parroquets* immediately commence flying round and round in flocks, screaming most hideously. In this way, they escape the hawk.” His last note is a quotation from “Topographical Description of the State of Ohio, etc.” It is, “The green paroquet with a yellow crown, a species of parrot, is very common. It has a harsh unpleasant note, and although easily tamed, it cannot be taught to imitate the human voice. The habits of these birds in some respects, are singular. They are always seen in flocks, which retire at night into hollow trees, where they *suspend themselves by their bills*. These birds also retreat to hollow trees in winter. There have been found, after a severe winter, prodigious numbers in a large tree, filling the whole cavity, where they had perished by the severity of the cold.”

In 1815, the above mentioned Daniel Drake in discussing the climate of Ohio takes exception to the opinion of Jefferson, that “the Ohio-countries (are) warmer, in the same parallels, than the Atlantic states.” He says ¹ “much reliance is placed on the growth and residence, in this country, of certain plants and animals, which in the maritime states are, it is said, not found as far north by several degrees. Of the former Mr. Jefferson has cited the reed and catalpa; of the latter, the parakeet. . . . This bird, it is true, resides constantly along the Mississippi, Ohio, and their tributary rivers, as far north as 39° 30', and is seen occasionally up to 42°.

¹ Drake, Daniel. *Natural and Statistical View, or Picture of Cincinnati and the Miami Country, etc.* Cincinnati, 1815, pp. 115, 118, 119.

But it is a well ascertained fact, that the climate of these latitudes is much colder than that of places in the Atlantic states, where this bird is rarely seen. There must be causes, therefore, for its higher latitude in this country, that are not connected with climate. One of these, Professor Barton suggests, is the southern course of our great rivers. If this bird, as most of its family still are, was originally an inhabitant of the tropics, it must have migrated into the depths of this region, along the Mississippi and Ohio. The wide alluvial vallies of these rivers, it is observed by the late ingenious and lamented Alexander Wilson, abound in the favorite food of this bird; such as the fruit of the cockle burr (*xanthium strumarium* L), cypress, hackberry, beech and sycamore, most of which are rare or unproductive in Pennsylvania. To these, the same distinguished Ornithologist remarks, may be added the salines or salt licks of this country, about which he never failed to see flocks of paroquets. Finding a region abundantly stored with agreeable food, this bird long since became its permanent inhabitant; and acquired hardness of constitution sufficient to enjoy good health, where the average heat of some months in winter is seven degrees below the freezing point. In the Atlantic states, the rivers flow east or south-east. In advancing towards Pennsylvania, therefore, this bird cannot travel *along*, but must *cross* their vallies; a movement which it has no inducement to make, and hence it generally stops among the cypress swamps of North Carolina and southern Virginia."

In the Illinois country in 1817, Samuel R. Brown finds ¹ "paroquets . . . abound in the same numbers as in other parts of the western country." He records it in Louisiana and speaks of the Mississippi as the place where "The traveller finds himself in the proper region of the paroquets . . ." When on Patoka river, Indiana, Elias Pym Fordham, Dec. 8, 1817 complainingly writes that ² "He saw a large herd of deer, but killed nothing but a parroquet." The next year, in Tennessee along the Mississippi, Estwick Evans ³ sees the paroquet. It "is smaller, and more beautiful

¹ Brown, S. R. The Western Gazetteer. Auburn, 1817, pp. 31, 146, 233.

² Fordham, E. P. Personal Narrative of, etc 1817-1818. Edited by F. A. Ogg. Cleveland, O., 1906, p. 138.

³ Evans, Estwick. A Pedestrious Tour, of Four Thousand Miles through the Western States and Territories during the Winter and Spring of 1818, etc. Concord, N. H., 1819, p. 200.

than the common parrot. They go in flocks, and their notes are rapid, harsh, and incessant. It is remarkable, that this bird is subject to a disease resembling apoplexy." In Warden's Account (1819), the paroquet is given as an inhabitant of Tennessee, where ¹ "Parroquets frequent the salt licks," in Illinois, and in Mississippi where "Parroquets are seen as high as the Bayou Pierre stream of the Mississippi."

The same year Schoolcraft gives this interesting résumé of the species under discussion.² "The *parakeet* is a beautiful bird; it is a kind of parrot; its colours are green, yellow, and red, all bright colours, and it is a pleasing sight to see a flock of them suddenly wheel in the atmosphere, and light upon a tree; their gaudy colours are reflected in the sun with a brilliance of the rainbow: they are a noisy bird, but their notes are disagreeable. This bird is first met with on descending the Ohio about the *falls*, after which they become plenty, are constantly to be seen on the Kentucky or Indiana shore, and add to the delight a traveller feels on descending that beautiful river." In a Journal of a Voyage up the Mississippi River from the mouth of the Ohio to St. Louis, on July 16, he says, "We frequently meet the *paroquet* on the banks of the river, and have passed several flocks today. This is a kind of parrot, a beautiful bird, which is very common in Louisiana, Missouri, and Kentucky." In the Expedition to the Rockies under Major Stephen Long, they (May 27, 1819) ³ "among other birds...noticed about Shawaneetown (Ill. on Ohio river), numerous flocks of *psittacus carolinensis*,....;" in another place (Engineer Cantonment) it is given in the list of birds; "near Louisville, May 25," "*Psittacus Carolinensis*...seen several times during the winter"; at the Falls of the Canadian river near the mouth of the Great North Fork, Indian Territory, "The paroquet (with others)...filled the woods with life and music"; and finally, Aug. 24 and 25, 1820, between the Canadian and Verdi-

¹ Warden, D. B. The Statistical, Political and Historical Account of the United States of North America; etc. 3 vols. 1819, Vol. II, p. 351, Vol. III, pp. 55, 10.

² Schoolcraft, H. R. A View of the Lead Mines of Missouri. New York, 1819, pp. 37, 232.

³ James, Edwin. Account of an Expedition from Pittsburgh to the Rocky Mountains Performed in the Years 1819 and '20, etc. under the command of Major Stephen H. Long. 2 vols. Phila. 1823. Vol. I, pp. 32, 373, 377. Vol. II, pp. 159, 226.

gris rivers, Indian Territory, they notice them. On the first day they say, "A flock of paroquets flew over our heads, uttering their loud note, with their usual loquacity." On the second, they record, "Another flock of paroquets were seen to-day."

In the next decade, we begin with H. R. Schoolcraft, the friend of the Indian, who holds at the time of his writing (1821) that ¹ "The paroquet is found as far north as the mouth of the Illinois, and flocks have occasionally been seen as high as Chicago." In 1821, this same author again speaks of this form.² "We first saw the perroquet about Terra Haute; and this bird is thence frequently seen to enliven the landscape. In the course of the day, we caught one of these showy birds, which had been pounced upon by a hawk. The flock, from which it was struck, happened, at that moment, to be passing over us; and it fell into the water quite near. The wound it had received was very slight, and it soon recovered; and by its cries attracted great numbers of its kind to follow." The year succeeding, J. Woods merely notes, that in Illinois,³ "Paroquets are the same as are seen in sages in England,—a mischievous bird." In 1822-23, William H. Blane at the same place where David Thomas observed them (French Lick, Ind.) says,⁴ "When crossing a small stream, the day after leaving Byrom's I saw a large flock of beautiful green and yellow parroquets. These are the first I had met with; and as they were very tame, and allowed me to come close to them, I got off my horse, and stopped a short time to admire them. I afterwards saw numbers of the same kind in the flats of the Wabash and Mississippi, for this beautiful bird apparently delights in the neighbourhood of streams."

When on the Alabama river below Cahawba, Jan. 6, 1826, Bernhard, Duke of Saxe Weimar encounters,⁵ "several paroquets flying round, who kept up a great screaming. Many were shot.

¹ Schoolcraft, H. R. *Narrative Journal of Travels from Detroit Northwest, etc. in the year 1820.* Albany, 1821, pp. 259, 260.

² Schoolcraft, H. R. *Travels in the Central Portions of the Mississippi Valley.* N. Y. 1825, p. 151.

³ Woods, J. *Two Years Residence in the Settlements on the English Prairie in the Illinois Country, United States, etc.* London, 1822, p. 198.

⁴ Blane, William H. *An Excursion through the United States and Canada during the Years 1822-23 by an English Gentleman.* London, 1824, p. 144.

⁵ Bernhard, Duke of Saxe-Weimar Eisenach. *Travels through North America, during the years 1825 and 1826.* Phila., Pa., Vol. II, pp. 35, 38, 99.

They are parrots, but of a larger species than the common kind, clear green with yellow tips to their wings, and orange-coloured heads, flesh-coloured bills, and long green tails." Two days later, on the same river near Claiborne, he "saw . . . , on the shores also, numbers of paroquets which make a great noise." Finally, Apr. 8, 1826, when at St. Charles, Missouri, he observes, "In the forest, however, there were . . . several paroquets, similar to those I had seen on the river Alabama." In 1826, Timothy Flint's *Recollections* appear. At Cincinnati he finds that a ¹ "Flock of paroquet are glittering among the trees," Along the Kentucky river "There were also great numbers of paroquets . . . "; and of Shawoetown, he says, "My children contemplated with unsated curiosity the flocks of parroquets fluttering among the trees, when we came near the shore." The same author, two years later, observes that in Missouri, ² "The beautiful parroquet frequents the sycamore bottoms, and poorly compensates by the extreme beauty of its plumage for the injury it does the orchard and garden fruits." In the Ohio river region, 1828, Judge James Hall finds, ³ "Here too, large flocks of paroquets are heard chattering in the woods, or seen sporting their bright green plumage in the sun-beams."

In 1832 we have a summary of the northward range of the Carolina paroquet at that time. Hinton says, (excerpts from Wilson's account) ⁴ "Of the 168 kinds of parrots enumerated by European writers as inhabiting the various regions of the globe, the Carolina parrot is the only species found native within the territory of the United States. This bird inhabits the interior of Louisiana, and the shores of the Mississippi and Ohio, and their tributary waters, even beyond the Illinois river, to the neighbourhood of Lake Michigan in lat. 42 degrees north; and, contrary to the generally received opinion, is chiefly resident in all these places. Eastward of the Apalachian, it is seldom seen farther north than the state of Maryland, though straggling parties have

¹ Flint, Timothy. *Recollections of the Last Ten Years Passed in Occasional Residences and Journeyings in the Valley of the Mississippi, etc.* Boston, 1826, pp. 52, 53, 84, 248.

² Flint, Timothy. *A Condensed Geography and History of the Western States or The Mississippi Valley.* Cincinnati, 1828. Vol. II, p. 73.

³ Hall, James. *Letters from the West; etc.* London, 1828, p. 190.

⁴ Hinton, J. H. *The History and Topography of the United States.* London, 1832, 2 vol. Vol. II, p. 155.

been occasionally observed among the valleys of the Juniata, and according to some, even twenty miles north-west of Albany, in the state of New York."

For some time after 1781 various authors continued to suppose¹ "that in this (Mississippi) valley the temperature is higher than in the same parallels in the Atlantic country.... Mr. Jefferson asserts, that.... paroquets, are seen farther north on the Ohio and Mississippi, than on the Atlantic shore. If it be so, the inference, drawn from these facts, might easily be shown to be erroneous, by showing, that their locality along these streams is fixed by other circumstances, than temperature.... The immense numbers of paroquets, that are seen on the lower courses of the Mississippi, will naturally push their colonies far to the north on that river, where they still find all circumstances, but temperature, the same; where there are old, large and hollow sycamore trees, the favorite haunts of this brilliant bird, furnishing it at once food, shelter, and a home." In another place, Flint speaks at equal length of the² "Parroquet, *psittacus Caroliniensis*. These are birds of the parrot class, seen from latitude 40° to the gulf of Mexico. Their food is the fruit of the sycamore, and their retreat in the hollow of that tree. They are a very voracious bird, preying on apples, grapes, and figs, and all kinds of fruit. They fly in large flocks, and are seen in greatest numbers before a storm, or a great change in the weather. They have hooked, ivory bills, a splendid mixture of burnished gilding and green on the heads, and their bodies are a soft and yet brilliant green. Their cry, as they are flying, is shrill and discordant. They are said to perch, by hanging by their bill to a branch. When they are taken, they make battle, and their hooked bill pounces into the flesh of their enemy. They are annoying to fruit orchards, and in this respect a great scourge to the farmer. We have seen no bird of the size, with plumage so brilliant. They impart a singular magnificence to the forest prospect, as they are seen darting through the foliage, and among the white branches of the sycamore." And, finally, in Florida, whose ornithology "is probably the richest in North

¹ Flint, Timothy. *The History and Geography of the Mississippi Valley*. 2nd edit., 2 vols. Cincinnati, 1832. Vol. I, pp. 32, 187, 292, 71, 72.

² Flint, Timothy. *Ibid.*, 2 vols in one. Cincinnati, 1832, Vol. I, pp. 71, 72, 200.

America . . .," he finds that "In the woods and stationary through the winter are paroquets, . . ."

In his "Travels in the Interior of North America," Maximilian, Prince of Wied, finds in 1833 at Fort Clarke on Missouri (old Lewis and Clarke fort) ¹ "There are, likewise many interesting species of birds, among which are , the Carolina parrot, . . ." At New Harmony on Wabash (winter 1832-33), he notes "(Psittacus Carolinensis) which remain here during the winter. No other kind of parrot seems to bear so great a degree of cold as this. We often saw them flying about in the forests, feeding on the fruit of the plane, when Reaumur's thermometer was at 11° below zero. In the mild climate of the Ohio and Wabash they remain all the year through. They are amusing birds in a cage, and become very tame." When northwest of Harmony at Long Pond, "near a field of maize, in the forest," he writes, "I saw a flock of parrots, of which we often shot many with great ease. They were not shy, and soon re-assembled after our shot had dispersed them. Their manner and note resembled those of the long-tailed paroquet of Brazil. With a shrill cry they flew rapidly from tree to tree, when their beautiful bright green colour was seen to great advantage. Mr. Bodmer has given a very faithful representation of one of these flocks (vide Plate 38, Vol. XXV). They eat the fruit of the planes; and if we did not disturb them, they sat in a row, close together to warm themselves in the faint beams of the January sun. Finally just beyond Weeping-water River (Neb.) he "saw some parrots, which Gardner had already observed," on the same river.

On a trip on the Mississippi river, Arfwedson twice records them. Above Rodney, Miss., he "landed, with a few fellow-travellers, at one of the firewood stations, with an intention of killing some of the small green parrots, which were flying in thousands about in the wood." Again, just below the mouth of the Arkansas river, "our sportsmen came running in every direction from the wood, carrying on their shoulders a variety of birds, among which parrots were

Early Works: *Travel's End* by R. G. Edwards. Vols. XXIII, p. 290; Vol. XXII, p. 28; 1971, 1972, 1973. Vol. XXIV, p. 195.

A. M. L. C. D. The United States and Canada in 1862, 1880 and 1903.
2 vols. 1864. Vol. II, pp. 96-101.

the most conspicuous, on account of the beauty of their plumes." About the same time, Shirreff at Springfield, Ill., finds,¹ "The forests abounded with green coloured paroquets, which fluttered about with a disagreeable noise, in flocks of six or seven." In a "Narrative of a Journey across Rocky Mountains to Columbia River," John K. Townsend at Boonville, Mo., April 8, 1834, says,² "We saw here vast numbers of the beautiful parrot of this country (the *Psittacus carolinensis*). They flew around us in flocks, keeping a constant and loud screaming, as though they would chide us for invading their territory; and the splendid green and red of their plumage glancing in the sunshine, as they whirled and circled within a few feet of us, had a most magnificent appearance. They seem entirely unsuspicious of danger, and after being fired at, only huddle closer together, as if to obtain protection from each other, and as their companions are falling around them, they curve down their necks, and look at them fluttering upon the ground, as though perfectly at a loss to account for so unusual an occurrence. It is a most inglorious sort of shooting; down right, cold-blooded murder." At Independence, Mo., he finds, "Parroquets are plentiful in the bottom lands, . . ."

Near Fort Leavenworth, Kansas, Murray writes,³ "I rambled about the woods near our halting-place, with my fowling-piece in my hand, . . . , but found nothing feathered upon which to exercise my skill except a small flock of green Parroquets (I believe, the species called *Psittacus rufirostris*.) I killed half a dozen, and we cooked them for supper; they were fat, and by no means unpalatable. I retained some of the more gay and brilliant feathers as presents for the Indians." At Hennepin, Ill., 1835, Hoffmann⁴ sat down upon a fallen tree among the tangled vines of the rich bottom opposite to Hennepin, and watched a flock of green paroquets fluttering among the wych-elms which here and there skirted the shore, . . . " In Texas, Edward records⁵ "a few flocks of the

¹ Shirreff, Patrick. *A Tour through North America; etc.* Edinburgh, 1835, p. 246.

² Townsend, John K., Phila., Pa., 1839, pp. 20, 21, 24.

³ Murray, Hon. C. A. *Travels in North America during the Years 1834, 1835 and 1836.* 2 vols. N. Y. 1839. Vol. I, p. 184.

⁴ Hoffmann, C. F. *A Winter in the West by a New Yorker.* 2 vols., N. Y., 1835. Vol. I, p. 282.

⁵ Edward, D. B. *The History of Texas; etc.* Cincinnati, 1836, p. 75.

green paroquet whose scream is anything but pleasant." The following year, Williams mentions the¹ "Paroquet *Psittacus carolinensis*" as of Florida; while in Missouri, Wetmore thinks,² "The paroquet found in Missouri deserves notice, as peculiar in character and attractive in plumage. This is a bird strangely resembling the green parrot in colour and form; and it is reported of them, that at night they repose within the cavity of a hollow tree, hanging by their curved Roman-nose-beaks. This report may require confirmation." The last notes of the decade are from the pen of Judge Hall, who says,³ "The paroquet is now seldom seen north of Cincinnati. They are abundant below Louisville, where flocks of them are heard chattering in the woods, or beheld sporting their green plumage in the sunbeams." In enumerating several forms of the western country, as an afterthought, he concludes "with the addition of the paroquet, a bird of beautiful plumage, but very bad character, whose thievish propensities renders him a great nuisance to orchards and cornfields."

In the next decade, Kennedy in a list of the birds of Texas, mentions⁴ "the gay, clamorous, and pilfering paroquet, . . ." In "Notes on the Northwest, etc." Bradford in 1846, finds⁵ "a small paroquet. . . (is) met occasionally." In the "Fauna and Flora of Georgia," George White 1849 speaks of⁶ "*Centurus Carolinensis*. It is a remarkable fact that our paroquets are very rapidly diminishing in number. Along our maritime districts where 15 or 20 years ago they were plentiful, scarcely any are now to be found; and it is probable that in a short time they will entirely disappear from our State."

In 1851, Schoolcraft in his "Personal Memoirs," when between Louisville and Shippensport, writes,⁷ "It was about this point, or a little above, that we first noticed the gay and noisy parroquet,

¹ Williams, J. L. *The Territory of Florida, etc.* New York, 1837, p. 73.

² Wetmore, A. *Gazetteer of the State of Missouri.* St. Louis, Mo., 1837. pp. 30, 31.

³ Hall, Jas. *Notes on the Western States:* Phila. 1838, p. 124.

⁴ Kennedy, Wm. *Texas: etc.* 2nd edit. London, 1841, p. 130.

⁵ Bradford, Wm. J. A. *Notes on the Northwest or Valley of the Upper Mississippi.* New York and London, 1846, p. 20.

⁶ White, George. *Statistics of the State of Georgia.* Savannah, 1849, p. 12.

⁷ Schoolcraft, H. R. *Personal Memoirs of a Residence of Thirty Years with the Indian Tribes of the American Frontiers: etc.* Phila., Pa., 1851, p. 26.

flocks of which inhabited the forests." Our last note comes Feb. 19-24, 1855, when Hon. A. M. Murray¹ "saw" at Palatka?, Fla., "several little green paroquets with yellow heads, the only kind of parrot common to Florida," — the only region where it was definitely known to exist 40 years later (1895).

In 1892, A. W. Butler in his valuable "Notes on the Range and Habits of the Carolina Parakeet"² summarizes the stages of its gradual restriction of range as follows: "From the evidence here presented it seems that they had disappeared almost wholly from Ohio and from Indiana, save the southwestern portion, by some time between 1835 and 1840, and that they left Indiana about 1858. So far as I know, there is but one record of the recurrence of the species in the region thus vacated. The late Dr. J. M. Wheaton gives, upon what he considers good authority, an account of a flock of twenty-five or thirty individuals at Columbus, Ohio, in July, 1862. Within about thirty years from the time first referred to by Audubon the species had entirely disappeared from a territory south of a line drawn, from Chicago, Ill., to Albany, N. Y., to, approximately, a line drawn from some point in Virginia, or perhaps North Carolina, to the lower Wabash Valley. In the next forty-five years they disappeared from southwestern Indiana, Illinois, Iowa, Nebraska, Kansas, Colorado, Kentucky, most of Missouri, and from the immediate vicinity of the Mississippi River, also from the States of the Atlantic coast as far south as Florida. The steady contraction of occupied area still continues. They are now perhaps found in but a few restricted localities. In the southern part of Florida they are still to be found in some numbers. Perhaps a small area in the interior of some of the Gulf States may still be occupied by them. Besides there is an area, whose limits are undefined, in Indian Territory, extending probably into Texas and possibly into Arkansas and Missouri, where Parakeets are said to be found still. It is but natural to think that the extinction of these birds is but a question of a few years." In conclusion, he says, "All facts concerning their former distribution and their habits as noted when they ranged north of the Ohio River, are

¹ Murray, A. M. Letters from the United States, Cuba, and Canada. 2 vols. in one. N. Y., 1856, p. 228.

² 'The Auk', IX, Jan., 1892, pp. 49-56.

very much desired." We trust the present recital of records (not usually encountered in the normal course of ornithologic investigations) will be only one of many answers to this earnest appeal, an incentive to greater search both for other records and for living representatives, and a worthy supplement of the interesting articles already published.

NOTES ON PALMER'S THRASHER (*TOXOSTOMA*
CURVIOSTRE PALMERI).

BY EARLE F. STAFFORD.

AMONG the most noticeable and interesting birds about the ranch I had taken in Tucson, Arizona, were a pair of Palmer's Thrashers. The ranch was situated on the border of the creosote and cactus-grown desert, of which this species is characteristic; and while the birds were abundantly scattered among the cholla cactus portions of the desert, especially about the ranches, each of which appeared to have its two, these notes are based, in their details, wholly upon the observation of my own pair.

The Palmer's Thrasher resembles the eastern Brown Thrasher (*Toxostoma rufum*) in carriage, flight and general traits of behavior, having the same nervous vivacity; flying low and rapidly, and running with extraordinary speed on the ground, where most of its food is obtained. I have seen my birds spend much time in the yard half squatting, with braced feet, digging holes of considerable depth (some as deep as two and a half inches) with quick, powerful blows of their sickle-like beaks; or casting aside the mould and parched soil with nervous sidewise thrusts, in search of grubs. On those parts of the desert, too, affected by the birds the ground usually shows plentiful signs of their probing.

The song of this species suggests that of the eastern Thrasher, but lacks its variety and separation into distinct phrases, and is more in the nature of a loud, interrupted carol, clear, and melodious.

Its two or three note call is sharp and startling, like the "sing" of a whip stroke echoing upon itself. These, together with low trills and Wren-like chatters, uttered at times when the birds are together, were the only notes I heard; and the song is not to be confused with the feverish, rollicking music of the Bendire's Thrasher (*Toxostoma bendirei*) — a bird nearly as common in this region as *palmeri*.

For its nesting site the Palmer's Thrasher, selects the cholla cactus (*Opuntia cholla*) almost exclusively, so that one finds it difficult to think of the one apart from the other. This cactus is a formidable plant of light green color, which is scattered now thickly now sparsely over the desert and low mesas, and fairly bristles with barbed spines. In almost every one of good dimension I found a Thrasher's nest, or the remnants of one. Most of the nests are quite unconcealed, for concealment in such a site is both difficult and apparently unnecessary. I have noticed, however, that the nests were usually overhung by some portion of the cactus, possibly for shade. The birds perch readily on the bristling cactus branches, and somehow manage to step between, or gingerly over, the thickset spines. I seemed to have observed a certain cautiousness exercised in the performance, but it is skilfully and easily accomplished without mishap. The Thrashers are fully aware of the danger, however, for the branches in the immediate neighborhood of the nest are completely disarmed, the spines having been bent at the tip or broken off, so that comfortable roosts and safe passage to and from the nest are assured — obviously the work of the bird's bill.

When I arrived at the ranch on January 16, 1912, the pair were conspicuous daily about the yard, usually appearing together and seldom wandering far from each other in their various activities. The male was in song, his favorite perch being the roof-end of the shed whence he could view his nest and domain, and where I was able to photograph him from as near as ten feet while he alternately carolled and preened in the sun, totally indifferent to me. My very gradual approach, gentle movements, and appearance of distraction disarmed his suspicion, and the click of the shutter was the cause of only mild and transient interest. I was surprised to observe how little man as an enemy is feared by many of the birds

in this part of the country. When motionless or moving carelessly about one occasions no more fear than a sheep or a horse, to be merely avoided rather than feared. Commenting on this fearlessness my notes say: "Last night as we sat motionless on the porch one of the Thrashers approached by stages to within five feet of us, caught a moth beneath the umbrella trees, flew up into one of the trees just before me, and then to the tap and bent over again and again for the drops of water that collected just within the mouth of the faucet. All of these acts he performed utterly unconscious of us as living and observing creatures."

The nest which I supposed belonged to them — although I had not seen them near it — I had discovered in one of the two chollas on the ranch ground. It was bulky, yet neat: a deep cup lined with feathers, string, rootlets, straws and many horse hairs, sunk in a large structure of mesquite twigs lodged between the cactus branches. The top of the nest is some three and a half feet from the ground. In regard to this nest I verified a suspicion as thus recorded by my notes: "Jan. 26, 1912 — Last night at about eight o'clock was interested to visit the cholla wherein the Thrashers' nest is, and found one, and possibly both, of the birds at home. I flashed an electric light on the cactus as I approached, and one Thrasher at least flew out whistling shrilly in alarm. Whether the nest itself is occupied during the night is yet a question of doubt."

The next night I settled the question as told in this further extract from my notebook: "At about sunset, and while it was yet quite fully light, I took a small chair and seated myself almost within arm's reach and in full view of the cholla cactus back of the sheds. For twenty minutes nothing appeared save a troop of Desert and Brewer's Sparrows flying by, cheeping, to their roost in the low mesquites. As yet there was no sign of the Thrashers. Suddenly, as the gloom was faintly beginning to gather, one of the birds, without previous warning, arrived from the east and lighted on a fence post near me. I sat quite motionless, but he evidently regarded this unwonted object near his home with suspicion. I felt that he was examining me. Then he uttered, fairly in my ear, a volley of his whip-like whistles, which, after a moment, was loudly answered upon a sudden from the second bird, which seemed to come from the south. The two, thus joined for the night, flew

about in the vicinity of the chollas, though not yet to them, singing and purring softly to each other. One sat just beyond a bush in front of me, on the ground, for ten or more minutes. It was still so light that I contented myself with glances through nearly closed lids. However the birds seemed oblivious of my presence—indeed accepted it as an inanimate feature of the place, and I was quite prepared to have one light upon my head as readily as on the nearby post. I fancied at times, however, that they were watchful.

"At length I heard them enter the chollas close at hand, uttering low notes; and then silence. I looked and saw one perched crouched, I think on a certain de-spined branch above the nest. The other I could not see. For a half hour the bird sat, facing the sunset, and motionless, and I could see its long curved beak and slim body outlined against the sky. As it grew darker I opened my eyes more freely, and I imagined it regarding me the while. At length it moved, and turned about—I thought it had detected me and was on the point of flight—but instead it slid gently down into the big nest and disappeared in its ample cup.

"After another quarter hour I softly started to rise, hoping to escape without disturbing the sleeping bird, but the other Thrasher, which had meanwhile been perching amidst the ruins of a nest in the second cactus, moved uneasily, and when I stood up both darted out whistling in great fright." I have not been able to make out which one of the pair is honored with the comfortable home nest, and which one makes shift in the unsheltered ruins in the adjacent cactus; or whether there is turn-about. I rather think the female is the favored one, however.

"After sunset and before sunrise every day a few sharp whistles from the direction of the chollas announced the roost-going and the waking of the Thrashers with precise punctuality. "They come to the yard" say my notes under January 29, "usually in the morning and again toward evening, drinking at the tub or tap, digging in different places, flying from tree to fence post, or roof top, full of ceaseless energy, and alertness. I have no notion where they spend the rest of their time; but they disappear utterly."

On February 14, I observed signs of courtship in the Thrashers: "One sidled along the fence, and the other followed at a respectful

distance, singing a little, *sotto voce*." They were constantly in company after this, having little pursuits and "tiffs," and the male, after two weeks of silence, sang oftener and with greater force than before.

On February 16 I watched the female gathering nesting material in the yard — a big beak load of straws, strings and odd bits. Having collected a full freight she flew up to a fence post, paused to look suspiciously at me, and then took flight over the shed and to the cholla where their nest is. On examination it proved that she was replenishing the old lining, which much use had deprived of softness. Twice afterward, on the 22nd and again on the 27th, I saw the female with nesting material. Regarding the latter occasion my notes say: "Just saw the female Thrasher with a small collection of straws and what-not in her beak. The male ran into the middle of the yard, snatched a piece of dry bread, and, running back to the wood-pile with it, began eating it by hammering off bits. Seeing this the female quietly let fall the nesting material and approached her mate with low begging notes. He avoided her at first, but as she followed begging he finally permitted her to carry off the greater part of the piece. She made no further pretense of gathering material, appearing to have forgotten the matter for the afternoon." In this easy and desultory fashion did the Thrashers enter upon their nesting duties. While instinct appeared to overcome any propensity for delay they may have had, they did not seem to have the active enthusiasm characteristic of birds that select a new site and build year after year.

The next day, February 28, was exceptionally spring-like, and on going to the cholla I flushed the female from the nest. She dropped silently to the ground and ran a few paces, turning to look back anxiously. During the next few days I flushed her in like manner, and the male was oftener seen on fence posts near the nest, although both birds continued to make visits to the yard.

Although the pair continued to use the nest at night, and the female was found on it frequently during the day for the following week or so, no eggs were laid, and I was obliged to leave the ranch, on March 9, without seeing their nesting underway. No doubt they were somewhat delayed by a very backward season. How long these birds had been on the ranch I do not know, but its

owner said that a pair had been about the place for years, season in and season out.

As far as I can conclude, then, two Palmer's Thrashers, having mated for life, select a suitable cholla, and build a nest that shall serve indefinitely with such yearly repair as it requires, for the rearing of young in the breeding season, and for sleeping quarters the rest of the year. That the young return to the parental nest I do not believe, but I should be interested to know what becomes of them. At any rate it is clear that after the young are launched, the old pair, while remaining inseparable, lapse into a condition of conjugal camaraderie, and that the male quietly courts his mate anew each spring in anticipation of nesting.

NOTES ON THE BIRDS OBSERVED ON A TRIP THROUGH THE MOUNTAINS OF WESTERN NORTH CAROLINA.

BY STEPHEN C. BRUNER AND ALEXANDER L. FEILD.

THIS paper is the outcome of a trip made by the authors through the mountains of western North Carolina. Our purpose in taking this trip, which was made in the summer of 1911, was to study the birds characteristic of this section and to secure additional information, if possible, concerning their occurrence. Before giving the ornithological records and observations made during this time, a short introduction will serve to give some idea of the character of the country visited and the nature of the trip.

Our route lay through the heart of the Appalachian mountain region and covered a distance of over one hundred miles. Seven counties were visited, one of which was in Tennessee. Only records from North Carolina are included in this paper. The six North Carolina counties traversed were Caldwell, Avery, Mitchell, McDowell, Yancey, and Buncombe. The scenery of this portion of the state is unsurpassed in its beauty and grandeur by any in eastern North America. To give some idea of its superiority to

that of New England, suffice it to say that Mount Mitchell, highest summit east of the Rocky Mountains, stands 426 ft. higher than Mount Washington in New Hampshire, while twenty-three other peaks also surpass the latter in height. Besides these, seventy-nine others tower above 5000 ft. The mountain slopes are covered with unbroken forests of hardwoods, firs, hemlocks, and white pines, except for the "Balds" or natural meadows of the higher summits.

It had for some time been our desire to go to this Switzerland of America to study the birds occurring there, and to get a taste of the simple and strenuous life. We had previously spent a considerable time in the mountains of this region, but had never made any systematic study of bird distribution. The trip was made entirely on foot. We carried no pack-mule nor cook. We had a light camping outfit and carried a 12 gauge single-barrel shotgun and a 303 Savage rifle. We did our own cooking, except for an occasional meal at a native's house. We usually carried with us provisions for several days. Our packs and all belongings weighed thirty-five pounds per man.

Our trip started on June 17 at Edgemont in Caldwell County, which lies upon the flanks of the Blue Ridge. Edgemont is sixteen hundred feet above sea-level and is therefore in the Upper Austral Zone. The immediate vicinity is rather rugged, and is broken by mountain chains whose elevation is about twenty-two hundred feet. Within a few miles of Edgemont on the banks of Wilson's Creek, we made our first camp. Here we remained two days, during which time final preparations were made. In the neighboring region birds were rather abundant. Forty-one species were recorded, of which number the Scarlet Tanager, Mountain Vireo, Song Sparrow, Towhee, and Phoebe were more or less characteristic of the mountains.

From Edgemont we went to Grandfather Mountain, a distance by road of eighteen miles. Our camp was situated on the southwestern side of the mountain in Avery County at an elevation of 4200 ft. Here we stayed one week. This mountain is perhaps the most picturesque in the state. Though not so high as many others — having an elevation of 5964 ft., — it stands far above all the summits immediately around it. Its surface is extremely

rugged. The steep peaks are masses of rock, covered with scanty and stunted vegetation. The lower slopes however are covered with vast hardwood forests and are watered by numerous streams. We visited the several peaks and the surrounding region. In the balsam forests near the summit were recorded such northern forms as the Brown Creeper, Golden-crowned Kinglet, and Winter Wren. In all, forty-nine species were noted. This was a greater number than was recorded at any other locality. Besides the three species above-mentioned, the Northern Raven, Carolina Junco, Song Sparrow, Towhee, Rose-breasted Grosbeak, Scarlet Tanager, Mountain Vireo, Cairns' Warbler, Chestnut-sided Warbler, Blackburnian Warbler, Black-throated Green Warbler, Canadian Warbler, Wilson's Thrush and Ruffed Grouse were more or less characteristic of the mountains. The Lesser Scaup Duck was a rather interesting record made here. The Blackburnian Warbler and Brown Creeper were not noted subsequently.

From Grandfather Mountain we went to Montezuma, five miles west, and rode by rail twenty-five miles to Roan Mountain station in Tennessee. From this place we ascended Roan Mountain (6313 ft.). The distance to the summit from the station was fourteen miles. This mountain lies on the boundary line between North Carolina and Tennessee, and is the highest peak possessed by the latter state. The greater part of the mountain, however, lies on the North Carolina side. Our camp was pitched in the balsam forest at an elevation of 6100 ft. We remained here ten days and explored all the neighboring country. Here as elsewhere on the trip the weather was ideal. Thirty-two species were recorded. Of these the Bald Eagle, Red-breasted Nuthatch, and Least Flycatcher had not been seen at either Edgemont or Grandfather Mountain. All of the characteristic mountain birds seen by us previously were noted here, except, as has been mentioned, the Brown Creeper and Blackburnian Warbler.

On July 9 we left Roan Mountain, which is in the northern part of Mitchell County, and went fifteen miles southeast to Toecane. From here we rode by rail twenty miles to Altapass, Mitchell County. Then we followed the crest of the Blue Ridge,—our course lying in McDowell, Mitchell, and Yancey Counties to Harvard, in Yancey County. We next proceeded up the South

Toe River to the foot of Mount Mitchell (6711 ft.), Yancey County, which was our final goal. We ascended the mountain by way of Steprock Creek, and placed our camp within a hundred yards of the summit. We were on the mountain only two days. It was our desire to remain longer here; but it became necessary for us to end our trip at this time. Twenty-five species were seen on the mountain. One of these, the Black-capped Chickadee, had not been recorded previously on our trip. Other species were the Golden-crowned Kinglet, Wilson's Thrush, Towhee, Scarlet Tanager, Red-breasted Nuthatch, Winter Wren, Carolina Junco, Black-throated Green Warbler, Hairy Woodpecker, Song Sparrow, and Ruffed Grouse.

On leaving Mount Mitchell we went, through Yancey and Buncombe Counties, to Black Mountain station in the latter county. In covering this distance of twenty miles, we crossed the following peaks: Hallback (6403 ft.), Mt. Gibbs (6591 ft.), Clingmans Peak (6611 ft.), Potato Knob (6419 ft.), Pinnacle (5693 ft.), and several other lower summits. All of these peaks except the last-named lie in the Black Mountains, a spur of the Blue Ridge.

We reached Black Mountain Station on July 17, after having been exactly one month in the field and here concluded our observations.

The total number of species recorded was seventy-eight, not including a Spotted Sandpiper (*Actitis macularia*) seen in Carter County, Tennessee, a few miles from the North Carolina line (elevation 2800 ft.). Of this number only about twenty could be considered peculiar to the mountain region, the other fifty-nine being found as summer residents to a greater or less extent over the entire state. The following is an annotated list of twenty-three of the more interesting species observed.

1. ***Marila affinis*.** LESSER SCAUP DUCK.—On June 23 a male and two females of this species were seen on Kawana Lake near Linville in Avery County. The elevation of this lake is about 3700 ft. above sea-level. The time and locality would suggest that these were breeding birds although there are no breeding records for North Carolina. This duck has, however, been seen during the summer in the coastal region and is supposed by some to breed there.

2. ***Bonasa umbellus umbellus*.** RUFFED GROUSE.—This well known game bird was noted on only two occasions, on Grandfather Moun-

tain at an altitude of about 4000 ft. (an adult with a brood of half grown young) and on the south side of Mt. Mitchell at an altitude of 6500 ft.

The "Pheasant" is found in this state only in the mountains, where it is fast diminishing in numbers, due largely to the fact that it is in most places hunted at all seasons of the year.

3. *Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.—A Bald Eagle was observed several times soaring above the higher points of the Roan Mountain in Mitchell County. We were informed that Eagles were not uncommon in that section and that several had been killed on the mountain.

4. *Sayornis phoebe*. PHEBE.—This bird was recorded in Caldwell, Avery, Mitchell, McDowell and Yancey Counties. Although the Phoebe sometimes nests in the central portions of the state, it is a characteristic summer resident only in the mountains, where it is rather common below 5000 ft.

5. *Empidonax minimus*. LEAST FLYCATCHER.—On the south side of Roan Mountain at an altitude of about 4500 ft. this bird seemed to be rather common, especially along Little Rock Creek (where two specimens, an adult and an immature, were secured on July 6). We did not observe it elsewhere.

6. *Corvus corax principalis*. NORTHERN RAVEN.—Two or three of these strange birds were observed on nearly every day of our stay on Grandfather Mountain. A single pair seemed to be residents on Roan Mountain. They were nearly always seen hovering about the highest peaks. The mountaineers informed us that these birds feed largely on carrion, but that they sometimes attack and devour young lambs. (Large flocks of sheep are kept on both Grandfather and Roan Mountains.)

The Raven is fast becoming one of the state's rarest birds and is now nearly if not entirely confined to the highest mountains.

7. *Junco hyemalis carolinensis*. CAROLINA JUNCO.—This Junco was found rather commonly in Avery, Mitchell, and Yancey Counties at altitudes ranging from about 3000 to 6700 ft. on the summit of Mt. Mitchell. It was one of the few birds which was at all numerous on the summits of the highest mountains.

Several nests were found, as follows:

Date	Locality	Altitude	Contents
June 21	Grandfather Mt.	4200 ft.	3 young well-feathered.
26	Grandfather Mt.	4000 ft.	3 eggs.
July 2	Roan Mt.	5300 ft.	3 young just hatched.
2	Roan Mt.	5750 ft.	2 eggs.
2	Roan Mt.	6000 ft.	4 young fairly well feathered.
3	Roan Mt.	6100 ft.	4 eggs.
4	Roan Mt.	5800 ft.	Nest just completed.

8. *Melospiza cinerea melodia*. SONG SPARROW.—Probably no other bird was met with in so many places and at so many different elevations.

We found it common in six counties and at points ranging from 1600 ft. at Edgemont to 6700 ft. on the summit of Mount Mitchell.

9. *Zamelodia ludoviciana*. ROSE-BREADED GROSBEAK.— Only two individuals of this northern species were noted during the trip, one in Avery County on the Linville River (elevation 3800 ft.) and the other on Grassy Ridge, Mitchell County (elevation 6000 ft.).

10. *Piranga erythromelas*. SCARLET TANAGER.— The Scarlet Tanager was fairly common throughout most of the country visited below 5000 ft. It was recorded in Caldwell, Avery, Mitchell, McDowell, and Yancey Counties.

11. *Bombycilla cedrorum*. CEDAR WAXWING.— Noted in the Transition and Canadian Zones in Avery, Mitchell, Yancey, and Buncombe Counties, but was nowhere common. Several were seen on Roan Mountain at an altitude of 6100 ft.

12. *Lanivireo solitarius alticola*. MOUNTAIN VIREO.— This subspecies of the Blue-headed Vireo was observed only in Caldwell, Avery, and Mitchell Counties, but it is probably tolerably common throughout the mountains.

13. *Dendroica caerulescens cairnsi*. CAIRNS' WARBLER.— On Grandfather Mountain this was the commonest warbler present. A nest containing three eggs was found on June 22. It was a very neat affair, constructed of strips of bark and rootlets, lined with fine rootlets and hair, and placed about one foot from the ground in a cinnamon fern (*Osmunda*).

After leaving Grandfather Mt. Cairns' Warbler was seen on only two occasions, once on the south side of Roan Mountain and again in the South Toe River valley in Yancey County.

14. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— Noted rather frequently in portions of Avery and Mitchell Counties. It was most numerous in the valleys near cleared land at altitudes between 3000 and 4000 ft.

15. *Dendroica fusca*. BLACKBURNIAN WARBLER.— The Blackburnian Warbler was tolerably common in the large deciduous forests on the northwest side of Grandfather Mountain. Although diligent search was made we did not find it elsewhere.

16. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— This warbler was found to be fairly common on Mount Mitchell, Roan, and Grandfather Mountains at altitudes ranging from about 3000 ft. to 6600 ft.

17. *Wilsonia canadensis*. CANADIAN WARBLER.— On Grandfather Mountain Canadian Warblers were rather common, being almost as abundant as Cairns' Warbler. They were quite noisy and not at all shy. On Roan Mountain they were much less numerous, being seen on only one or two occasions on the southern slope. After leaving this mountain they were not again observed.

18. *Nannus hiemalis hiemalis*. WINTER WREN.— Was rather common on all the high mountains visited above 4000 ft. On Mount Mitchell it was observed within a few feet of the summit. The bird's

characteristic loud, bubbling song made its presence known in a great many places where otherwise it would have undoubtedly been entirely overlooked.

19. *Certhia familiaris americana*. BROWN CREEPER.—BROWN Creepers were noted by us only on Grandfather Mountain where they were tolerably common above 4000 ft. An immature specimen barely able to fly was captured on June 24 at an altitude of 5600 ft. This is the first breeding record for this mountain.

20. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Was observed only on Roan Mountain and Mount Mitchell, at which places it was fairly common. This Nuthatch together with the Black-capped Chickadee and Golden-crowned Kinglet were the only birds which seemed entirely characteristic of the Canadian zone, and were found at no time below 5000 ft.

21. *Penthestes atricapillus atricapillus*. BLACK-CAPPED CHICKADEE.—This bird was only seen on Mount Mitchell and the adjoining peaks. It is probably rather common throughout the higher portions of the Black Mountains. Two specimens were taken on Potato Knob, July 16.

22. *Regulus satrapa satrapa*. GOLDEN-CROWNED KINGLET.—Was noted on Mount Mitchell, Roan and Grandfather Mountains. It was the most abundant bird found on Mount Mitchell, the balsams being fairly alive with both adults and birds of the year. A well feathered young was taken on Grandfather Mountain, June 24.

23. *Hylocichla fuscescens fuscescens*. WILSON'S THRUSH, VEERY.—This bird seemed to occur in reasonably large numbers throughout the mountains, above about 4000 ft., but was more abundant on Grandfather Mt. than elsewhere. Here we had the good fortune to hear it sing in company with the Wood Thrush and to compare their songs. We both were of the opinion that the Veery's song is not to be compared with that of the Wood Thrush for clear musical expression; but that there is something about the song of the former which makes it singularly impressive.

As it is desirable to classify the different species according to the elevation at which they were seen, we give below the result of such a grouping. Each bird necessarily falls into one of six groups, as follows:

1. Species (4) observed only in the Canadian Zone (above 5000 ft.).
2. Species (13) observed only in the Canadian and Transition Zones (2000 ft. to 5000 ft. and above).
3. Species (19) observed only in the Transition Zone (2000 ft. to 5000 ft.).
4. Species (10) observed in the Canadian, Transition, and Upper Austral Zones (from below 2000 ft. to above 5000 ft.).

5. Species (28) observed only in the Transition and Upper Austral Zones (from below 2000 ft. to 5000 ft.).

6. Species (4) not observed above the Upper Austral Zone (not above 2000 ft.).

The lists that follow give a fairly good idea of the elevation at which the species may be expected. They are a record of our observations during the trip. We are aware of the fact that some of the observations are incomplete. For instance, the American Crow is placed in the second group, "Species observed only in the Canadian and Transition Zones." The Crow is known to occur from Mexico to Canada, and is evidently met with at all elevations.

1. Species observed only in the Canadian Zone (above 5000 ft.):

BALD EAGLE (*Haliaeetus leucocephalus leucocephalus*).

RED-BREASTED NUTHATCH (*Sitta canadensis*).

BLACK-CAPPED CHICKADEE (*Penthestes atricapillus atricapillus*).

GOLDEN-CROWNED KINGLET (*Regulus satrapa satrapa*).

2. Species observed only in the Canadian and Transition Zones (2000 to 5000 ft. and above):

RUFFED GROUSE (*Bonasa umbellus umbellus*).

HAIRY WOODPECKER (*Dryobates villosus villosus*).

NORTHERN RAVEN (*Corvus corax principalis*).

CROW (*Corvus brachyrhynchos brachyrhynchos*).

CAROLINA JUNCO (*Junco hyemalis carolinensis*).

ROSE-BREASTED GROSBEAK (*Zamelodia ludoviciana*).

CEDAR WAXWING (*Bombycilla cedrorum*).

BLACK-THROATED GREEN WARBLER (*Dendroica virens*).

WINTER WREN (*Nannus hiemalis hiemalis*).

BROWN CREEPER (*Certhia familiaris americana*).

WHITE-BREASTED NUTHATCH (*Sitta carolinensis carolinensis*).

WILSON'S THRUSH (*Hylocichla fuscescens fuscescens*).

ROBIN (*Planesticus migratorius migratorius*).

3. Species observed only in the Transition Zone (2000 ft. to 5000 ft.):

LESSER SCAUP DUCK (*Marila affinis*).

GREAT BLUE HERON (*Ardea herodias herodias*).

COOPER'S HAWK (*Accipiter cooperi*).

RED-SHOULDERED HAWK (*Buteo lineatus lineatus*).

SPARROW HAWK (*Falco sparverius sparverius*).
 BARRED OWL (*Strix varia varia*).
 SCREECH OWL (*Otus asio asio*).
 KINGBIRD (*Tyrannus tyrannus*).
 LEAST FLYCATCHER (*Empidonax minimus*).
 MEADOWLARK (*Sturnella magna magna*).
 BACHMAN'S SPARROW (*Peucea aestivalis bachmani*).
 ROUGH-WINGED SWALLOW (*Stelgidopteryx serripennis*).
 YELLOW WARBLER (*Dendroica aestiva aestiva*).
 CAIRNS' WARBLER (*Dendroica caerulescens cairnsi*).
 CHESTNUT-SIDED WARBLER (*Dendroica pensylvanica*).
 BLACKBURNIAN WARBLER (*Dendroica fusca*).
 MARYLAND YELLOW-THROAT (*Geothlypis trichas trichas*).
 CANADIAN WARBLER (*Wilsonia canadensis*).
 TUFTED TITMOUSE (*Baeolophus bicolor*).

4. Species observed in the Canadian, Transition, and Upper
 Austral Zones (from below 2000 ft. to above 5000 ft.):

TURKEY VULTURE (*Cathartes aura septentrionalis*).
 RED-TAILED HAWK (*Buteo borealis borealis*).
 FLICKER (*Colaptes auratus luteus*).
 CHIMNEY SWIFT (*Chætura pelagica*).
 SONG SPARROW (*Melospiza melodia melodia*).
 TOWHEE (*Pipilo erythrophthalmus erythrophthalmus*).
 RED-EYED VIREO (*Vireosylta olivacea*).
 MOUNTAIN VIREO (*Lanivireo solitarius alticola*).
 CATBIRD (*Dumetella carolinensis*).
 BLUEBIRD (*Sialia sialis sialis*).

5. Species observed only in the Transition and Upper Austral
 Zones (from below 2000 ft. to 5000 ft.):

BOBWHITE (*Colinus virginianus virginianus*).
 MOURNING DOVE (*Zenaidura macroura carolinensis*).
 BELTED KINGFISHER (*Ceryle alcyon alcyon*).
 DOWNY WOODPECKER (*Dryobates pubescens medianus*).
 WHIP-POOR-WILL (*Antrostomus vociferus vociferus*).
 RUBY-THROATED HUMMINGBIRD (*Archilochus colubris*).
 PHOEBE (*Sayornis phoebe*).
 WOOD PEWEE (*Myiochanes virens*).
 ACADIAN FLYCATCHER (*Empidonax virescens*).

BLUE JAY (*Cyanocitta cristata cristata*).
ENGLISH SPARROW (*Passer domesticus*).
GOLDFINCH (*Astragalinus tristis tristis*).
CHIPPING SPARROW (*Spizella passerina passerina*).
FIELD SPARROW (*Spizella pusilla pusilla*).
CARDINAL (*Cardinalis cardinalis cardinalis*).
INDIGO BUNTING (*Passerina cyanea*).
SCARLET TANAGER (*Piranga erythromelas*).
WHITE-EYED VIREO (*Vireo griseus griseus*).
BLACK AND WHITE WARBLER (*Mniotilta varia*).
PARULA WARBLER (*Comsothlypis americana americana*).
OVEN-BIRD (*Seiurus aurocapillus*).
LOUISIANA WATER-THRUSH (*Seiurus motacilla*).
YELLOW-BREASTED CHAT (*Icteria virens virens*).
HOODED WARBLER (*Wilsonia citrina*).
BROWN THRASHER (*Toxostoma rufum*).
CAROLINA WREN (*Thryothorus ludovicianus ludovicianus*).
CAROLINA CHICKADEE (*Penthestes carolinensis carolinensis*).
WOOD THRUSH (*Hylocichla mustelina*).

6. Species not observed above the Upper Austral Zone (not above 2000 ft.):

GREEN HERON (*Butorides virescens virescens*).
CRESTED FLYCATCHER (*Myiarchus crinitus*).
PRAIRIE WARBLER (*Dendroica discolor*).
KENTUCKY WARBLER (*Oporornis formosus*).

We wish to acknowledge our indebtedness to Mr. C. S. Brimley of Raleigh, N. C., for valuable suggestions in the preparation of this paper.

A NEW SUBSPECIES OF THE RUFFED GROUSE.

BY OUTRAM BANGS.

SOME years ago I was accustomed to go shooting every autumn in Nova Scotia, and each season I was more and more impressed by the very dark coloration of the Ruffed Grouse killed there. I therefore made into skins during my last two shooting trips to this province a series of sixteen Grouse.

I am very sorry to say I did not skin any young individuals but picked out old birds of both sexes, selecting them one or two at a time from our daily bags which were often large.

Upon comparing specimens the Nova Scotia bird proved to be quite as different from *Bonasa umbellus togata* (Linn.) as that form is from *Bonasa umbellus umbellus* (Linn.), and has been described in MS. as a new subspecies for years. The reason it has not until now been published is that Mr. Brewster had in contemplation a monograph of the Ruffed Grouse for which he had, for a long time, been gathering material, and the new form was to have appeared in it. This project is now indefinitely postponed and the Nova Scotia Grouse may be known as:—

***Bonasa umbellus thayeri*¹ subsp. nov.**

Type, from Digby, Nova Scotia, adult ♂, no. 11453, Bangs Coll., Museum of Comparative Zoölogy. Collected Oct. 9, 1892, by O. Bangs.

Characters. Similar to *Bonasa umbellus togata* (Linn.) but general color, of upper parts darker, more dusky or sooty, less grayish; the whole under parts (except throat) heavily and regularly banded with dusky, the dark bands much blacker and much more boldly contrasted against the ground color — less blended.

In *B. umbellus togata* the flanks and sides are sometimes barred as heavily and the bars are as dark in color as in the Nova Scotia form, but this heavy barring never extends to the chest, breast or middle of belly.

Size and proportions about as in *B. umbellus togata* except the bill which averages just a little larger.

B. umbellus thayeri presents two phases of coloration, which are both

¹ Named for my esteemed friend and co-worker in ornithology, John E. Thayer.

very dark, and not very different; a phase in which there is much dull chestnut or burnt sienna in the upper parts and tail and another in which the tail is wholly dull gray and black and the upper parts are but little varied with dark chestnut markings. The color and markings of the underparts is not different in the two phases, except that very reddish birds sometimes have the bases of the feathers of the upper chest dull chestnut instead of dusky.

Measurements.

No.	Sex.	Wing.	Tail.	Tarsus.	Exposed Culmen.	Culmen to base of forehead.
11453	♂ ad. Type	184.	157.	50.	15.5	27.
11454	♂ ad. Topotype	181.	163.	48.	16.	28.
11456	♂ ad. "	186.	150.	49.	14.5	25.
11459	♂ ad. "	181.	165.	45.	15.	26.5
11452	♂ ad. "	178.	150.	46.	15.	26.
11462	♀ ad. "	180.	132.	45.	12.5	23.
11465	♀ ad. "	179.	124.	46.	12.5	22.
11461	♀ ad. "	174.	130.	46.	14.	23.5
11463	♀ ad. "	173.	123.	46.	12.5	22.
11466	♀ ad. "	169.	126.	44.	13.	23.

Remarks. The Canadian Ruffed Grouse, *Tetrao togatus* of Linnaeus was based wholly upon Brisson's *Lagopus bonalia canadensis* of "Canada." The type locality being without doubt, the region between Montreal and Quebec. There are in Mr. Brewster's collection two fine adult males from the vicinity of Quebec, which are in every way similar to numbers of skins from Maine, Vermont, northern New York, New Hampshire and the higher interior parts of Massachusetts with which I have compared them.

It is probable that the new form is confined to the almost insular province of Nova Scotia, although I cannot be sure about the bird from the coast of New Brunswick as the specimens I have before me are in worn midsummer plumage, and not comparable with the Nova Scotia specimens, all of which were taken in October.

SIXTEENTH SUPPLEMENT TO THE AMERICAN
ORNITHOLOGISTS' UNION CHECK-LIST OF
NORTH AMERICAN BIRDS.

THIS constitutes the first supplement since the publication of the third edition of the Check-List in 1900, and includes all cases of proposed additions to the Check-List which were considered at the meeting of the Committee held in Washington, D. C., April 24-26, 1912.

In accordance with a resolution of the Committee adopted at the previous meeting, cases of proposed changes in the Check-List based upon purely nomenclatural grounds while considered and acted upon by the Committee will not be published for the present. The object of this action is to maintain the stability of the names of the new Check-List and make no nomenclatural changes until a reasonable test of time has shown the necessity for them.

Committee	{	J. A. ALLEN, <i>Chairman</i> . CHARLES W. RICHMOND, <i>Secretary</i> . WILLIAM BREWSTER. JONATHAN DWIGHT, JR. C. HART MERRIAM. ROBERT RIDGWAY. WITMER STONE.
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I. ADDITIONS TO THE CHECK-LIST.

p. 53. After *Puffinus auricularis* insert

***Puffinus carneipes* GOULD. Pale-footed Shearwater. [95.1.]**

Puffinus carneipes GOULD, Ann. and Mag. Nat. Hist., XIII, May, 1844, 365 (Small islands off Cape Leeuwin, Western Australia).

RANGE.—Australian and New Zealand Seas, northward to Japan and casually to the coast of California.

p. 120. Immediately before *Totanus melanoleucus* insert

Totanus totanus (LINNÆUS). **Redshank.** [253.1]

Scolopax totanus LINNÆUS, Syst. Nat., ed. 10, I, 1758, 145. (Sweden.)

RANGE.—Europe across Asia Minor south of lat. 55° N. to eastern Siberia. South in winter to Africa, India and the Malay Archipelago. Casual in Greenland.

p. 141. *Lagopus lagopus lagopus* is subdivided, the Ungava form being added as

d. **Lagopus lagopus ungavus** RILEY. **Ungava Ptarmigan.** [301 c.]

Lagopus lagopus ungavus RILEY, Proc. Biol. Soc. Wash., XXIV, Nov. 28, 1911, 233 (Fort Chimo, Ungava).

RANGE.—Ungava and probably the eastern shore of Hudson Bay.

p. 149. *Zenaidura macroura carolinensis* is restricted to eastern North America and a western race is added as

c. **Zenaidura macroura marginella** (WOODHOUSE). **Western Mourning Dove.** [316a.]

Ectopistes marginella WOODHOUSE, Proc. Acad. Nat. Sci. Phila., VI, No. 3, 1852, 104. ("Cross timbers," north fork of Canadian River.)

RANGE.—Pacific Coast and San Clemente Island east to the Mississippi Valley.

p. 150. *Melopelia asiatica* is subdivided and the following is to be inserted after the range of the species.

a. **Melopelia asiatica asiatica** (LINNÆUS). **West Indian White-winged Dove.** [319.]

Columba asiatica LINNÆUS, Syst. Nat., ed. 10, I, 1758, 163. ('East Indies' = Jamaica ?)

RANGE.—Southern Florida south to Cuba and Jamaica; casual in the Bahamas.

b. **Melopelia asiatica trudeaui** (AUDUBON). **White-winged Dove.** [319a.]

Columba trudeaui AUDUBON, Birds Amer. (8°), 1844, VII, 352, pl. 496. (Texas.)

RANGE.— Lower California, southern Arizona, southwestern New Mexico and southern Texas, south to Costa Rica. Casual in southeastern California and Colorado; accidental in Washington.

- p. 173. *Otus asio cineraceus* is restricted to the Upper Sonoran and Lower Transition zones of the area now given as its range, while another form from the lower ground is added as

- j. *Otus asio gilmani* SWARTH. **Sahuara Screech Owl.** [373i.]
Otus asio gilmani SWARTH, Univ. Calif. Pub. Zool., VII, No. 1, May 26, 1910, 1. (Blackwater, Pinal Co, Arizona.)

RANGE.— Lower Sonoran life zone of southeastern California, Arizona, and probably New Mexico; and northwestern Mexico.

- p. 178. *Glaucidium gnoma gnoma* is found to be entirely extralimital and the form occurring in the United States will be known as

- a. *Glaucidium gnoma pinicola* NELSON. **Rocky Mountain Pygmy Owl.** [379.]
Glaucidium gnoma pinicola NELSON, Proc. Biol. Soc. Wash., XXIII, June 24, 1910, 103. (Alma, New Mexico.)

RANGE. — Mountains of northern Colorado, Arizona, and New Mexico, including the Sierra Madre of northern Mexico.

- p. 183. *Ceryle alcyon* is subdivided and the following is to be inserted after the range of the species:

- a. *Ceryle alcyon alcyon* (LINNÆUS). [390.]
Alcedo alcyon LINNÆUS, Syst. Nat., ed. 10, I, 1758, 115 (North America).

RANGE.— As now given for the species but excluding the northwest coast.

- b. *Ceryle alcyon caurina* GRINNELL. **Northwestern Belted Kingfisher.** [390a.]

Ceryle alcyon caurina GRINNELL, Univ. Calif. Pub., Zool., V, No. 12, March 5, 1910, 388. (Graveyard Point, Montague Island, Prince William Sound, Alaska.)

RANGE.— Northwestern coast district.

- p. 186. *Dryobates villosus hyloscopus* is restricted to the Canadian and Transition zones of California and Nevada south to northern Lower California and a new race is added as

i. *Dryobates villosus leucothorectis* OBERHOLSER. **White-breasted Woodpecker.** [393h.]

Dryobates villosus leucothorectis OBERHOLSER, Proc. U. S. Nat. Mus., 40, No. 1840, June 3, 1911, 608. (Burley, New Mexico.)

RANGE.—Canadian and Transition Zones from southern Utah, northwestern and central New Mexico and extreme southwestern Texas, south to the mountains of western Zacatecas, Mexico.

- p. 188. *Dryobates scalaris bairdi* proves to be entirely extralimital. The form so named in the Check-List will be known as

d. *Dryobates scalaris cactophilus* OBERHOLSER. **Cactus Woodpecker.** [396.]

Dryobates scalaris cactophilus OBERHOLSER, Proc. U. S. Nat. Mus., 41, No. 1847, June 30, 1911, 152. (Tucson, Arizona.)

- p. 188. *Dryobates scalaris lucasanus* is restricted to the southern half of the peninsula of Lower California north to Ubai and Plaia Maria Bay. The form occupying the northern half of the peninsula will be known as

d. *Dryobates scalaris eremicus* OBERHOLSER. **San Fernando Woodpecker.** [396b.]

Dryobates scalaris eremicus OBERHOLSER, Proc. U. S. Nat. Mus., 41, No. 1847, June 30, 1911, 151. (San Fernando, Lower California.)

RANGE.—Lower California north of Ubai and Plaia Maria Bay except the extreme northeastern portion.

- p. 195. *Colaptes chrysoides* is subdivided and the following is to be inserted after the range of the species

a. *Colaptes chrysoides chrysoides* (MALHERBE.) **Gilded Flicker.** [414.]

Geopicus (Colaptes) chrysoides MALHERBE, Revue et Mag. Zool., IV, 1852, 553. (America).

RANGE.—Southern Lower California.

b. *Colaptes chrysoides brunnescens* ANTHONY. **San Fernando Flicker.** [414a.]

Colaptes chrysoides brunnescens ANTHONY, Auk, XII, No. 4, Oct., 1895, 347. (San Fernando, Lower California.)

RANGE.— Middle Lower California.

- c. *Colaptes chrysoides mearnsi* RIDGWAY. **Mearns's Gilded Flicker.** [414b.]

Colaptes chrysoides mearnsi RIDGWAY, Proc. Biol. Soc. Wash., XXIV, Feb. 24, 1911, 32. (Quitovaquito, Arizona.)

RANGE.— Extreme southwestern California, northern Lower California and southern Arizona south to southern Sonora.

- p. 250. Immediately after *Spinus* insert the following

[GENUS **EMBERIZA** LINNÆUS.

Emberiza LINNÆUS, Syst. Nat., ed. 10, I, 1758, 176. Type, by subdesig., *Emberiza citrinella* LINNÆUS (Gray, 1840).

Emberiza rustica PALLAS. **Rustic Bunting.** [601.1.]

Emberiza rustica PALLAS, Reise Russischen Reichs, III, 1776, 165, 698. (Valley of the Turgutui, Dauria.)

RANGE.— Northern Europe to eastern Siberia and Kamchatka, south to China in winter. Casual on Kiska Island, Alaska.]

- p. 255. *Passerculus sandwichensis alaudinus* is subdivided, the form occupying the Great Basin region being known as

- c. *Passerculus sandwichensis nevadensis* GRINNELL. **Nevada Savannah Sparrow.** [542d.]

Passerculus sandwichensis nevadensis GRINNELL, Univ. Calif. Pub., Zool., V, No. 9, Feb. 21, 1910, 312. (Soldier Meadows, Humboldt Co., Nevada.)

RANGE.— Humboldt and Washoe counties, Nevada, and probably throughout the Great Basin, south in winter to the Colorado Desert and Los Angeles Co., California.

- p. 352. *Penthestes rufescens rufescens* is subdivided, the form occupying the extreme northern part of the range of the species being known as

d. *Penthestes rufescens vivax* GRINNELL. Valdez Chestnut-sided Chickadee. [741c.]

Penthestes rufescens vivax GRINNELL, Univ. Calif. Pub. Zool., V, No. 12, March 5, 1910, 414. (Latouche Island, Prince William Sound, Alaska.)

RANGE.— Prince William Sound Region, Alaska.

p. 365. Immediately after *Cyanosylvia* insert

[GENUS **CALLIOPE** GOULD.

Calliope GOULD, Birds Europe (part 16), II, March 1, 1836, pl. 118 and text. Type, by monotypy, *Calliope lathamii* GOULD = *Motacilla calliope* PALLAS.

***Calliope calliope* (PALLAS.)**

a. [***Calliope calliope calliope***. Extralimital.]

b. ***Calliope calliope camtschatkensis* (GMELIN). Greater Kamchatkan Nightingale. [764.1.]**

Turdus camtschatkensis GMELIN, Syst. Nat., I, ii, 1789, 817. ("Camtschatca)."

RANGE.— Northeastern Asia, casual on Kiska Island, Alaska.]

II. PROPOSED ADDITIONS TO THE CHECK-LIST NOT ACCEPTED.

Podiceps griseigena reported from Greenland (Henninger, Auk, 1911, 492). This proves to be an error since the original Danish record refers to *P. griseigena* var. *major* which is *Colymbus holballi*.

Canachites canadensis atratus GRINNELL, Univ. Cal. Publ., Zool., V, 380, 1910. Characters insufficient for recognition.

Thalassonætes pelagicus (PALLAS), reported to have been seen by A. H. Clark near Unalaska (Proc. U. S. Nat. Mus., 38, p. 57, 1910), but as no specimen was obtained the record is not accepted.

Dryobates villosus icastus OBERHOLSER, Proc. U. S. Nat. Mus., 40, 612, 1911. Too near *D. r. hyloscopus*.

Dryobates villosus orius OBERHOLSER, Proc. U. S. Nat. Mus., 40, 609, 1911. Too near *D. r. hyloscopus*.

- Dryobates villosus sitkensis* SWARTH, Univ. Cal. Publ., Zool., VII, 315, 1911. Regarded as an intergrade between *D. v. harrisi* and *leucomelas*.
- Dryobates pubescens glacialis* GRINNELL, Univ. Cal. Publ., Zool., V, 390, 1910. Regarded as an intergrade between *D. p. nelsoni* and *gairdneri*.
- Dryobates scalaris symplectus* OBERHOLSER, Proc. U. S. Nat. Mus., 41, 155, 1911. Too close to *D. s. cactophilus*.
- Phlæotomus pileatus picinus* BANGS, Proc. N. E. Zool. Club, IV, 79, 1910. Too near *P. p. abieticola*.
- Phlæotomus pileatus floridanus* RIDGWAY, Proc. Biol. Soc. Wash., XXIV, 33, 1911. Too close to *P. p. pileatus*.
- Centurus uropygialis brewsteri* RIDGWAY, Proc. Biol. Soc. Wash., XXIV, 32, 1911. Too close to *C. uropygialis*.
- Colaptes auratus borealis* RIDGWAY, Proc. Biol. Soc. Wash., XXIV, 31, 1911. Too near *C. auratus luteus*.
- Molothrus ater artemisiæ* GRINNELL, Univ. Cal. Publ. Zool., V, 276, 1909, and
- Molothrus ater dwighti* BISHOP, Auk, XXVII, 61, 1910. Too close to *M. ater*.
- Melospiza melodia inexpectata* RILEY, Proc. Biol. Soc. Wash., XXIV, 234, 1911. Regarded as an intergrade between *M. m. rufina* and *merrilli*.
- Passerella iliaca sinuosa* GRINNELL, Univ. of Cal. Publ., Zool., V, p. 405, 1910. Regarded as identical with *P. i. annectens* (= *meruloides*).
- Passerella iliaca altivagans* RILEY, Proc. Biol. Soc. Wash., XXIV, 234, 1911. Too near *P. i. schistacea*.
- Pipilo maculatus curtatus* GRINNELL, Univ. Cal. Publ., Zool., VII, 309, 1911. Too close to *P. m. arcticus*.
- Passerina ciris pallidior* MEARNs, Proc. Biol. Soc. Wash., XXIV, 217, 1911. Too close to *P. ciris*.
- Thryomanes bewicki marinensis* GRINNELL, Univ. Cal. Publ., Zool., V, 307, 1910. Too close to *T. b. spilurus*.

Thryomanes bewicki catalinae GRINNELL, Univ. Cal. Publ. Zool., V, 308, 1910. Too close to *T. b. charienturus*.

Turdus iliacus, reported from Greenland (Henninger, Auk, 1911, p. 492) is already in the list as *Turdus musicus*.

III. PROPOSED CANCELLATIONS NOT ACCEPTED.

Melospiza melodia merrilli.

Melospiza melodia morphna.

Proposition to cancel these two forms (Kellogg, Condor, XIII, 1911, p. 118-120) rejected.

A number of other cases were deferred on account of lack of necessary material.

GENERAL NOTES.

The Ancient Murrelet (*Synthliboramphus antiquus*) in Ontario.—The only two Ontario records of the Dovekie (*Alle alle*) prove, on examination of the birds, to be Ancient Murrelets. The first was recorded by Mr. J. H. Ames in 'The Auk', 1902, p. 94, as follows: "A Dovekie (*Alle alle*) was shot Nov. 18, 1901, by H. Macdonald, a fisherman, two miles out in the lake from Toronto, Ontario. Mr. John Maughan, a taxidermist, now has it in his possession. I was present when he opened the stomach, which was empty except for a few small fish bones. It was a female and evidently a young bird, as there was no white on the secondaries and the back was slaty instead of a black." On turning up my Journal I find that I too had noted the absence of white on the wings and the slaty-blue of the back, I also noticed that the beak was very small and the bird itself large for a Dovekie but had no suspicion of the real identity of the bird and repeated the record in my 'Birds of Toronto' (Auk, 1906, p. 441). Recently through the kindness of Mr. Maughan I have been able to compare his bird with a series of Ancient Murrelets in my collection, the Toronto bird is much like a female from Howkan, Alaska, April 12, 1897, but lacks the long white feathers of the sides of the head and nape, the plumbeous rump and upper tail feathers are obscured by dusky, the body feathers under the wings plumbeous instead of black, the chin and throat sooty on only the upper half, and the beak narrower and weaker.

Mr. Maughan's data give the length as 10.25 in., spread 18.5 in.; weight 4 oz., feet light bluish gray, webs darker.

The second bird was recorded by Mr. Everett P. Wheeler in 'Bird Lore', 1909, p. 174, as follows, "November 15, 1908, I found on the Canadian shore of Lake Erie, about seven miles from Buffalo, the body of a Dovekie (*Alle alle*). The skin was identified by Mr. Savage and Dr. Cummings of the Buffalo Academy of Science and is still in my possession. The specimen was a male, entirely free from subcutaneous fat, and the crop was empty." Wishing to know what had become of this bird I wrote to Mr. James Savage of Buffalo who very kindly put me in communication with Mr. Wheeler and in September 1910, the latter presented me with what remained of the specimen explaining that it had been almost completely destroyed by moths. Fortunately the wings are perfect enough to be measured, there are a few feathers on the head, and the beak and feet are uninjured, and the bird can be identified with certainty. There is one other record of the Ancient Murrelet in the region of the Great Lakes, one taken at Lake Koshkonong, Wisconsin, late in October, 1882, and recorded by George B. Dennett (Auk, 1884, p. 98). Of the many accidental migrants to the Great Lakes hardly another species has so restricted or remote a range. The Ancient Murrelet is confined in summer to the North Pacific; breeding in the Aleutians most to the Commander Islands and Kamschatka thence south to the Kurile Islands, apparently not entering Bering Sea proper. In winter it ranges south to Japan, and more rarely from Alaska along the British Columbian coast, and south to California. In view of the restricted range it is difficult to account for the presence of the Murrelets on the Great Lakes, if the birds are young as they likely are, Mr. A. C. Bent's suggestion that they were stragglers to the Arctic Ocean and becoming lost were carried through the Northwest Passage with the ice that moves eastward with the prevailing current, is not improbable. Against this is the fact as Mr. Bent points out, that the Arctic ice has always proved an effective barrier to prevent the eastward wanderings of Bering Sea forms, none of the Auklets or Murrelets having even near relatives on the east coast of Arctic America. Once into Hudson's Bay it is not difficult for a sea bird to reach the Great Lakes.—J. H. FLEMING, *Toronto, Ont.*

Franklin's Gull in Wisconsin.—On April 23, 1911, the wings, tail, and numerous feathers of a Franklin's Gull (*Larus franklini* Sw. & Rich.) evidently recently killed were found on the shore of Lake Mendota, near Madison, Wisconsin. The bird was identified at Washington from a wing, and this wing is preserved in the collection of the University of Wisconsin. This gull is very uncommon so far east at any season, and especially so in spring. This seems to be the first spring record of it from this vicinity since 1870.—F. L. CONOVER, *Madison, Wisconsin.*

Sabine's Gull on the Mississippi River.—I have two skins of *Xema sabini* from the collection of the late C. K. Worthen with the data in his handwriting, both young birds as follows: 20032 Coll. of J. H. F. "Male

juv., Mississippi River near Fox Island, Missouri, September 15, 1900": 16220 Coll. J. H. F. "Male, Warsaw Illinois, September 15, 1900." These are no doubt two of the three birds referred to by Widmann in 'Birds of Missouri' 1907, p. 26, but the bird is sufficiently rare in the United States to have the location of the specimens definitely recorded.—J. H. FLEMING, Toronto, Ont.

Caspian Tern (*Sterna caspia*) in Minnesota.—On Sept. 29, 1911, Mr. Dan. Schmid, keeper of Big Island Park, shot an adult male and a juvenal female from a flock of eight Caspian Terns on Lake Minnetonka. Both specimens were in good plumage, and were made into skins. The male is now in my collection. This is the first time that I have met with this species in this State.—ALBERT LANO, *Excelsior, Minnesota*.

The Brown Pelican on Long Island.—On May 26, 1912, we observed a Brown Pelican (*Pelecanus occidentalis*), feeding around the shoals at the western end of Oak Island beach. When first seen, at long range, we decided that it was a stick, with a white top. Five minutes later, to our intense surprise, the stick flew away, and we knew at once it was a Brown Pelican. The great size, the long bill and pouch, the whitish crown and the slow sailing flight as it flapped away majestically over the water were unmistakable with the naked eye, not to mention 9 x binoculars. The bird settled on another sand-bar, and while preening its feathers, we approached to within 150 yards. For the next hour and a half the bird flew from bar to bar, as the tide rose, occasionally catching a fish, by scooping it up with its lower mandible, but for the most part sitting on a bar, preening its feathers, until the tide flushed it off, when it would fly to another. This is the second record for Long Island, as far as we have been able to discover.—JULIUS M. JOHNSON and LUDLOW GRISCOM, *New York City*.

An Additional Specimen of the Labrador Duck.—A short time ago, while examining the contents of a large case containing a miscellaneous collection of wild-fowl skins, stored in the museum of the Boston Society of Natural History, I came upon an unlabelled skin that I identified as a juvenal male *Camptorhynchus labradorius*. Dr. Glover M. Allen also examined the specimen and referred it to the same species.

Unfortunately there was no label whatsoever on the skin to give the slightest clue as to when or where it was taken, and there is no reference to any such bird in the *Proceedings* of the Boston Society of Natural History.

Mr. C. Emerson Brown, who has mounted the specimen, states that it was in very poor condition: being so grease-burned that on relaxing, it disintegrated into countless small fragments. Besides leaving large masses of fat adhering to the skin the preparator had neglected to clean the skull. Such carelessness would lead one to believe that the bird was taken long ago, at a time when neither collector nor recipient considered this species worthy of any especial attention.

The following description may be of interest, though lacking in certain details, as it was taken from the mounted bird making a proper examination of the wings, axillars, etc., impossible.

Head brownish gray, darker on crown. Chin and throat white, this area extending half way around the upper neck, its posterior margin being less clearly defined owing to some of the feathers having narrow ashy tips. Rest of neck ashy. Upper breast with a light ashy area about one and a quarter inches wide, very slightly washed with light brown, extending about three quarters around the body. Breast dark gray with tinge of light brown, the ends of the feathers being minutely dotted and streaked with black. Lower breast, sides, belly, and under tail-coverts brownish gray, lighter on the belly. Scapulars brownish gray, some of the feathers having narrow ashy tips. Long scapulars more pearly. Lesser wing-coverts ashy. Secondaries and ends of greater wing-coverts white. Primaries brownish black; alula blackish brown. Lower back and tail-coverts brownish gray. Tail blackish brown with a slight hoary tinge.

Measurements in inches as follows: culmen, 1.55; bill along gape, 2.25; tarsus, 1.55; middle toe, 2.15.

This specimen is now on exhibition, with another young male of more advanced plumage, in the museum of the Boston Society of Natural History, and is I believe the forty-fourth extant to date.—WINTHROP S. BROOKS, *Milton, Mass.*

Massachusetts Geese.—The past autumn of 1911 will long be remembered by the gunners along the track of Canada Geese in eastern Massachusetts, on account of the great abundance of these birds. The numbers seen and taken were extremely unusual, and probably have not been exceeded for a great many years.

It has been suggested that protection of fowl on the island of Anticosti may have had something to do with the present apparent increase of our coastal flight. Be that as it may, the next few years will show whether this present abundance is a real increase or only a temporary fluctuation.

In 1908 about 1450 geese were taken in eastern Massachusetts and in 1909 about 1900 (see Auk for July, 1910). This year I took the trouble to again estimate the total kill, though in 1910 I have no figures. The total arrived at for this past season of 1911 is 3518, or nearly twice as many as for 1909 and almost two and a half times as many as for 1908.

There were 2112 geese counted at Dedham and over 1000 of these lit in the pond.

The figures from which the 1911 totals were obtained are given below.

Duxbury Bay	800
Silver Lake	475
Accord Pond, Hingham	300
Great South Pond, Plymouth	225
John's Pond, Sandwich	185
Robbins Pond, Bridgewater	200

Dedham Pond, Pembroke	245
Mashpee Pond, Mashpee	120
Snippituit Pond, N. Rochester	100
Abington Meadows	100
Whitman Pond, Weymouth	120
Great Pond, Weymouth	35
Hingham Harbor	70
Ponkapoag Pond, Canton	108
Indian Head Pond, Pembroke	50
Factory Pond, Hanson	50
Chebacco Pond, Essex	41
Lily Pond, Cohasset	45
Bog in South Hingham	50
Jacob's Pond, Assinippi	50
All other places, about	150

Total 3519

These figures cannot be actually vouched for, but I believe that they are not far from the actual totals. The figure 150, for "all other places" is probably much too low. Mr. A. B. Gardner of Accord, Mass., who collected most of this data for me can be absolutely relied upon. He writes under date of March 7, 1912. "I know that most of these records are correct, and think the rest of them are very close to the right number as I saw someone from most of the places, etc."

There are about 40 gunning stands included in the records.—J. C. PHILLIPS, *Wenham, Mass.*

A Peculiar Plumage of the Canada Goose (*Branta canadensis canadensis*).—On Nov. 29, 1911, Dr. Rockwell A. Coffin, of Boston, Mass., killed at Clark's Island, near Plymouth, Mass., a male Canada goose, on which the white patch on throat and cheeks was missing. The bird's head was entirely black, with the exception of a few small lighter colored feathers on its throat, which showed only upon a very close examination. "He came in with seven other geese on the 29th of November. The other geese were darker on the side of the head than usual." Possibly this may have been an entire family, in which this peculiarity of plumage had become more or less marked.—FRED. H. KENNARD, *Boston, Mass.*

Late Record of the Red-backed Sandpiper (*Pelidna alpina sakhalina*) in Massachusetts.—On Dec. 27, 1911, I noted a small flock of Red-backed Sandpipers (*Pelidna alpina sakhalina*) at Muskeget Island, Mass. On the 31st I came upon a flock of nine in a driving snowstorm, two of which I secured and found very fat.

I last noted four of these birds on the 14th of January, 1912. Though the nine previous days had been very severe, covering almost all the shore

with ice, these four birds seemed in good condition and they were busily engaged in finding an apparent abundance of food.

The latest record that I can find for this species in Massachusetts, is December 24 (Howe & Allen, *Birds of Mass.*, p. 42.)—WINTHROP S. BROOKS, *Milton, Mass.*

An Albino Egg of Wilson's Plover.—On May 20th, I found a nest of Wilson's Plover (*Ochthodromus wilsonius*) containing three eggs, one a perfect albino. As this egg in size, shape, and texture of shell, corresponds with the other two there seems to be no doubt but that the same bird laid them all. The nesting site was on a shell reef seldom visited by anyone.—GILBERT R. ROSSIGNOL, JR., *Savannah, Georgia.*

Pigeons do not Carry their Eggs.—Bendire in his 'Life Histories of North American Birds' quotes a statement from Mr. Otho C. Poling to the effect that the Band-tailed Pigeon may carry an egg "embedded in the feathers of the belly, and further, held by the legs while flying; but in such cases they seem simply to alight on a limb of a spruce and incubate there without any nest." The only tangible evidence Mr. Poling gives for this extraordinary conclusion, is to the effect that he has more than once, on shooting a female, found an egg embedded in the feathers of the belly. Bendire endorses neither the observations nor the conclusion, but says (p. 126):

"I have quoted, without further comment, the remarkable statement of Mr. Poling, in regard to the alleged removal of eggs by this pigeon."

The matter might have been allowed to rest, were it not that Knowlton, in his *Birds of the World* (p. 420) has quoted Mr. Poling's conclusion with approval, thus:

"It seems to be established beyond question that when the sitting bird is driven from the nest the egg is not infrequently carried along, being held close to the abdomen by the feet, and immediately on alighting on a limb incubation is resumed without any nest. On this point Mr. O. C. Poling, writing to Major Bendire, says: "etc.

Let us see whether the alleged habit is "established beyond question." The existence of such a habit is rendered extremely improbable, in the first place, by a consideration of the general behavior of pigeons. Pigeons never carry anything with their feet. I have seen pigeons tear up their nest with their bills and thus roll out two eggs that had failed to hatch; but this is very different from carrying the eggs. Again, a pigeon recognizes her egg only by the fact that it is in her nest. Put a strange egg in her nest and she will accept it as her own. Remove her own egg from the nest and place it "on a limb" and she has no means of knowing that it is her egg. Even in those cases, to be mentioned presently, in which I have seen a female carry an egg from the nest inadvertently, I believe she did not recognize it as an egg; at least, she did not sit on it outside the nest. Even if the female carried an egg from the nest and sat on it herself, it is hard to

conceive what would happen when it came time for the male to sit. Mr. Poling makes mention of the bird carrying only one egg. But the set consists of two eggs, and the birds do not incubate though they may stand over the first egg and guard it until the second egg is laid. The European Cuckoo, it is said, sometimes carries her egg in her bill (see summary of data, by Francis H. Herrick, in the *Journal of Experimental Zoology*, 1910). But such a habit is altogether foreign to the behavior of pigeons.

Hence, we must not believe that the Band-tailed Pigeon carries its eggs unless on the very best of evidence. Have we the best of evidence? Not at all. That a pigeon was shot with an egg embedded in the feathers of the belly indicates, not that the bird had carried the egg voluntarily, but that the egg had become accidentally fastened to the feathers. The egg may have been cracked or nicked, and glued to the feathers by the exuding albumen. I have seen even an unbroken egg carried about because stuck to the feathers by some albumen from a broken egg.—WALLACE CRAIG, *Orono, Maine*.

Note on the Bald Eagle and Osprey.—On a number of occasions I have had the good luck to see a Bald Eagle rob an Osprey of his hard-earned meal; but never, until last summer, had I seen the Osprey retaliate in any way whatever. Frequent observations have led me to look upon the latter bird as rather peaceable for a bird of prey, and strongly inclined to attend strictly to business.

On the occasion in question I came out on the shore of Lake Androscoggin, a considerable body of water in the Androscoggin River region of Maine, just in time to see an interesting combat, involving some very fine wing work. The Eagle had just forced the Osprey to drop a fish, but had failed to catch it as it fell. The smaller bird then withdrew to a point about fifty feet above, and suddenly swooping down, attempted to strike the Eagle on the back. Just as it looked certain that the broad back must receive the full force of the stroke, up went one great wing, with an agility and a skill that would have done credit to a practised boxer, and the Osprey was tossed aside with apparently almost no effort. This was repeated several times; when the Osprey, evidently discouraged, gave up the unequal fight and winged away toward the far side of the lake. Immediately the Eagle dropped to the water, and picking up the fish made off with it.

Throughout the performance, the difference between the birds in build and action was very striking: the Eagle, broad, heavy, apparently slow and clumsy—deceptively so, as the event showed; the Osprey, slender, undulating, all agile grace and skill.—FREEMAN F. BURR, *White Plains, N. Y.*

Maynard's Cuckoo (*Coccyzus minor maynardi* Ridgway) in Cuba.—On March 9, 1912, I secured a female specimen of the Mangrove Cuckoo, along the bay at "Manati," Guantanamo, Cuba. Not being sure as to

which form it was, I sent it to Mr. J. H. Riley of Washington for identification, who reports it to be *Coccyzus minor maynardi* Ridgw., adding that there was no certainty heretofore to which form the Cuban bird belonged. I have another specimen of this species also a female taken by me along the bay at "Los Caños," Guantanamo on March 26, 1911, which had remained unidentified in my collection until now.—CHAS. T. RAMSDEN, *Guantanamo, Cuba*.

The Cuban Whip-poor-will (*Antrostomus cubanensis* Lawrence) **with Young**.—On April 20, 1912, while riding over some pastures 10 miles south of Bayamo, a city in Oriente Province, Cuba, I came to a patch of woods about two acres in extent which stood in the middle of the pasture and through which flowed a small stream; suddenly there flew up from under the horse's feet four *Antrostomus cubanensis*—two adults and two three-fourths grown young. I secured one of the young by throwing a stick at it, the parents flew short distances each flight, to attract me away from the spot, but I was unable to secure them as I had no gun.

I believe this to be the first record of the young being seen or taken, as also a new locality record: Dr. Gundlach states that he has taken it only at "La Cienaga de Zapata" and in the mountains north of Guantanamo.—CHAS. T. RAMSDEN, *Guantanamo, Cuba*.

A Starling at Squantum, Mass.—On March 26, 1912, on a trip to Squantum and Moon Island with Mr. Richard M. Marble, a Starling (*Sturnus vulgaris*) was seen on the headland, known as Squantum Head. It was in company with four Robins and was viewed on successive perches upon the scattered trees and also as it walked on the ground. The bird was not seen on subsequent visits to the place either by ourselves or by other observers. As Squantum Head is within sight of the gilded dome of the State House, the occurrence of this individual Starling, is, so far as I am aware, the first record of the species in the immediate vicinity of Boston.—HORACE W. WRIGHT, *Boston, Mass.*

A case of Cannibalism among Blackbirds.—On June 17, 1911, in a patch of rushes bordering the Wisconsin River, at Tomahawk, Wisc., I noticed a great commotion among a colony of Red-winged Blackbirds. Upon investigation I found the object of the united attack of the Redwings was an adult male Bronzed Grackle. As the Grackles and Blackbirds appeared to live peaceably side by side all along the river I suspected the bird which was being attacked had wronged the Redwings, and to render my observations more certain I shot the Grackle, and on picking him up found a young Redwing in his bill. He had killed the Redwing by crushing its skull with his heavy bill and would no doubt have carried it off to his own young, had not the adult Redwings attacked him. Judging the young Redwing by its size, it had probably left the nest for about a week, and it is surprising that the Grackle should have selected so large a bird. An

investigation of the nests of the Redwings in the vicinity showed them to be either empty or only one or two young in the several nests which I located. This lead me to believe that the Grackles may have carried off some of the nestlings, for the Redwings usually have from three to five young to a nest.—J. A. WEBER, *Palisades Park, N. J.*

Rusty Blackbirds (*Euphagus carolinus*) **wintering in Essex Co., Mass.**—A flock of Rusty Blackbirds spent most, if not all, the past winter in Danvers, Mass. This seems remarkable considering the great severity of January and February, 1912.

Mr. Brewster records a flock of this species in Brookline, February 8, 1879. Mr. A. C. Conrey noted one on Concord turnpike, Concord, January 22, 1905. Howe & Allen, 1901, give February 20 as earliest, except the accidental February 8, and in Townsend's Birds of Essex Co., March 14 is given.

I first saw a flock of eight individuals during a snowstorm on January 29, feeding on a large pile of manure close to Burley St. On January 30, they were in the same place. I could not find out whether anyone had seen them before this. On February 6, Mr. G. A. Peabody saw twelve on his estate near the same spot, and on February 7, he counted eighteen. I looked up the flock again on February 18, and also counted eighteen birds. They were getting most of their food, apparently, from a large pile of horse manure. From that date until March 19, Mr. Peabody tells me he constantly saw the birds at the same place.—J. C. PHILLIPS, *Wenham, Mass.*

Lark Sparrow (*Chondestes grammacus grammacus*) **in Cuba.**—On December 12, 1911, I took in a "potrero" on the San Carlos Estate, Guantanamo, Cuba, a female specimen of the Lark Sparrow in very fine plumage. This is the first Cuban record for this species. The specimen was kindly compared and identified for me by Mr. W. DeW. Miller at the American Museum of Natural History.—CHAS. T. RAMSDEN, *Guantanamo, Cuba.*

Unusual Nest Site of the Cardinal.—I have known of Catbirds, Phoebe, Robins and Hummingbirds building and rearing their young in vines on porches or verandas; but it was not until the other day (May 11, 1912) that my attention was called to the fact of a Cardinal Grosbeak (*C. c. cardinalis*) exhibiting such implicit confidence in man.

This spring, a pair of these birds built their nest in a small, white wisteria vine running up some wire-netting on the porch of Mr. G. W. H. Soelner at 3436 Seventeenth Street, N. W., Washington, D. C., very near my own home. On the morning of the 13th of May, they completed the somewhat flimsy nest, and one egg was laid. A Purple Grackle, which had undoubtedly watched the entire proceedings, stole the egg a few hours after it had been deposited, and I doubt whether the Cardinals will return.—R. W. SHUFELDT, *Washington, D. C.*

Cliff Swallow (*Petrochelidon lunifrons* Say)—**A Cuban Record.**—I beg to report the taking of a male specimen of the Cliff Swallow on November 11, 1911. It was flying with others of this species in a band of Barn Swallows (*Hirundo erythrogastra*), quite early that morning, over abandoned cane fields of the San Carlos Estate, Guantanamo, Cuba. This I believe is the first Cuban record for the species.—CHAS. T. RAMSDEN, *Guantanamo, Cuba.*

The Connecticut Warbler in Central Park, New York City.—I was fortunate enough to find an individual of the Connecticut Warbler (*Oporornis agilis*) in Central Park on May 16. The bird was a male in curious plumage, as there was not the usual amount of slate-gray on the breast. At first sight I thought it was a Nashville Warbler, but soon noticed it walking on the ground, with its tail up in the air, and then obtained a view of its breast. It was absurdly tame, and was within eight feet of me, when first observed. During the day I showed it to about ten bird students. Mr. W. deW. Miller, of the American Museum of Natural History, came over in the afternoon, and four of us leaned in a row on a fence, while the bird walked unconcernedly around catching flies, not more than 15 feet from us. We were able to make out every detail, including the elongated tail-coverts. Part of the time the bird was so close that I was unable to focus on it with my binoculars. The Warbler remained in the Park in the rhododendron bushes for six days, walking about frequently in the open. This species is apparently a very rare spring migrant along the Atlantic Coast.—LUDLOW GRISCOM, *New York City.*

Type of the Genus *Saxicola*. In the April number of 'The Auk', p. 271, in commenting upon Mr. Gregory Mathews' discussion of the type of the genus *Saxicola*, I insisted that Gray's designation of *S. œnanthe* as the type settled the matter. While this conclusion is correct when we consider only the data presented by Mr. Mathews in the January Ibis, I entirely overlooked another paper (Novitates Zoologicae, XVIII, June, 1911, p. 20), in which he calls attention to the earlier designation by Swainson in 1827, of *Motacilla rubicola*. This, of course, alters the situation and renders necessary the use of *Saxicola* for the Chats (*Pratincola* of authors) while *œnanthe*, as stated by Mr. Mathews, will have to be used for the Wheatears.—WITMER STONE, *Acad. Nat. Sciences, Philadelphia.*

Two Interesting Records for Canada.—**Arquatella maritima couesi** (Ridg.) **ALEUTIAN SANDPIPER.** In going over the collections of the Geological Survey in the Museum, I find three specimens of this form of the Purple Sandpiper taken by Mr. Wm. Spreadborough at Clayquot, Vancouver Island, B. C., May 11, 1907. The subspecific determination was made by Dr. Jonathan Dwight who remarks that they are "undoubtedly *couesi*" though darker than the typical coloration and

approaching *maritima*. Clayquot is on the west coast of Vancouver Island in about latitude 49-15'. This forms the first record for this subspecies within the Dominion.

Scotiaptex nebulosa (Forster), GREAT GRAY OWL. Breeding records of this species are rare enough to make note of a bird recently received by the Museum. It is a young bird just changing from the natal down into the juvenal and first winter plumages. Patches of the former remain on all parts of the body but interspersed freely with the latter two. The natal down plumage is dull brown, made hoary by the lighter tips to the feathers. The underparts, wings, back of the neck and facial disk are barred with yellowish gray. The juvenal plumage includes the large flight and tail feathers which are as in first winter coloration. The remainder of the plumage is heavily barred with an ochraceous gray more yellow on the back of the neck and shoulders than elsewhere. The bars average about half an inch wide and the same distance apart. The first winter plumage shows but here and there in small patches and is about as generally seen in winter specimens.

The large wing and tail feathers are well formed and the bird was evidently capable of short flights. However it had not left the nest long nor was it able to fend for itself. Another in like plumage was taken at the same time so the brood had evidently not separated and I think we are justified in concluding that the nesting site was not far distant from the place of capture.

These birds were killed July 31, 1911, in the township of Chisholm, Nipissing District, Ont., by Mayor Kelly of Powassan, Ont. Chisholm township lies about five miles east of the extreme eastern corner of Lake Nipissing, extending south and east from that point.—P. A. TAVERNER, *Victoria Memorial Museum, Ottawa, Ont.*

Some Erroneous Wisconsin Bird Records.—In 'The Auk' for April, 1911, and again in the issue for April, 1912, Mr. Henry K. Coale refers to a pamphlet published in 1902 on 'Birds of Oconto County,' by A. J. Schoenebeck, and republishes some records for Wisconsin which seem to call for further consideration. After first reading Mr. Schoenebeck's list in 1903, I wrote him regarding certain records and received from him prompt and courteous replies, with full accounts of these extraordinary finds. Now that some of the most questionable have received the wide circulation and dignity of 'General Notes,' in 'The Auk' it seems necessary to publish what I have regarding them. Mr. Schoenebeck's absolute honesty and sincerity of belief in these records, at the time, is not to be questioned. It is purely a matter of mistaken identification, and it is a great pity that not one of the questionable records is backed up by a preserved specimen. Had not Mr. Coale republished them in 'The Auk' with the statement that most of the species recorded in Mr. Schoenebeck's original list were preserved in Mr. Schoenebeck's collection, I should have much preferred to say nothing about them.

The record of the Columbian Sharp-tailed Grouse (Auk, April, 1911, p. 276 and April, 1912, p. 238) several hundred miles beyond its known limits, and near the extreme eastern distribution of the Prairie Sharp-tail, seems so strange that I was surprised to see it seriously considered by Mr. Coale. Mr. Schoenebeck wrote me, under date of December 28, 1903, regarding this record: "On a collecting trip in October, 1897, I shot a pin-tail grouse of a very dark color, which we supposed to be *columbianus*. The skin was prepared and two days afterward we lost it, our collecting outfit, and tent by fire."

As to the Black Rail near the mouth of Oconto River, June 9, 1899 (Auk, April, 1911, p. 276) I have the following from Mr. Schoenebeck: "I have only seen this little rail running over dead reeds, but was satisfied that it was *P. jamaicensis*." This sounds to me much more like the young of the Coot, Gallinule, or King Rail; it may have been the Black Rail, but it is far north of its usual range and I hardly think the record should stand. Regarding the Eskimo Curlew (l. c., p. 276): "This specimen brought to me in April, 1899, was so badly spoiled that it was impossible to do anything with it, but the V mark on the breast shows that it was a true *N. borealis*." As a record for a bird virtually extinct at the date, and known from the state, even in the early years of its abundance, only as a very rare straggler, this identification seems open to question.

Of the specimen of the Anhinga (l. c., p. 276) Mr. Schoenebeck wrote me: "In the spring of 1889, Doctor Lawrence brought me this bird *in the skin*, but nearly fresh; claimed to be shot on the Green Bay shore; the skin was not made by an expert, it was only roughly made. The glossy black on the upper parts proved it to be a male. I do not know if Doctor Lawrence has the bird yet or not." It is possible that the Anhinga might wander some three hundred miles out of its regular range, but until this specimen comes to light and proves not to be a Cormorant, I do not think it should stand for the only authentic state record.

As to the breeding Chestnut-collared Longspurs: "This is one of the birds Capt. B. F. Goss and myself captured in June, 1893, on the great plains in the northwestern part of this county. We found a nest containing four eggs and another nearly finished. Now here I must say we were not careful enough about the identification. I shot the female bird and Mr. Goss as well as myself found it a true Longspur and on account of the black wing-coverts we called it the chestnut-collared. We did not save the bird. We were collecting eggs then and we only shot the birds for identification, but never saved any after identified." I think we may safely refuse to accept the determination of this bird, so far out of the known breeding range of the supposed species, by even so accomplished an ornithologist as was Captain Goss.

Mr. Schoenebeck's list contains so many notes of real value that it seems unfortunate that Mr. Coale has selected the few records so obviously based on error for re-publication in 'The Auk.'

While on the subject of Wisconsin bird records, I wish to correct an error

in the 'Birds of Wisconsin' (Bull. Wis. Nat. Hist. Soc., III, p. 124, 1903) for which I am in a way accountable. This is the inclusion in the Wisconsin list of the Long-tailed Chickadee (*Penthestes atricapillus septentrionalis*). Although some of the specimens in question were identified by no less an authority than Doctor Coues, it seems best to drop the subspecies from the state list, as the Long-tailed Chickadee, as now understood, is not known to range to this state, and I now believe the specimens then referred to it were only full plumaged winter examples of *atricapillus* proper.—N. HOLLISTER, U. S. National Museum, Washington, D. C.

Rare Virginia Birds.—There has been received by the U. S. National Museum, from Capt. Geo. D. Hitchens of Smiths Island, Virginia, the following birds, all having been taken at that place.

The Sooty Shearwater (*Puffinus griseus*) received in May, 1909, which is as far as known the first record for Virginia.

The Dovekie (*Alle alle*), a specimen was shot January 8, 1912, and sent in the flesh to the Museum. This species had been recorded previously from Smiths Island.

The Razor-billed Auk (*Alca torda*), a specimen was shot March 29, 1912, and sent to the Museum in the flesh, and upon preparing the specimen it was found to be in a much emaciated condition.—EDWARD J. BROWN, U. S. National Museum, Washington, D. C.

Notes from Boulder County, Colo.—The following are supplementary to the status of the species as given in Selater's Birds of Colorado.

***Ixobrychus exilis*.** LEAST BITTERN.—In the Auk, 1911, I recorded the nesting of this species near Boulder in June, 1910. Another nest was found in the same place on July 9, 1911, with five eggs. They were all hatched by July 20, and one of the young was seen by Dr. Morley out of the nest on July 30. These two nesting records are apparently the second and third for the state.

***Archibuteo lagopus sancti-johannis*.** ROUGH-LEGGED HAWK.—This is the only hawk at all common in the winter on the plains of Boulder Co. I have observed it frequently, singly or two and sometimes three in the course of a trip between the following dates of arrival and departure: Nov. 27, 1909–Mar. 19, 1910; Oct. 30, 1910–Mar. 14, 1911; Oct. 15, 1911–Mar. 31, 1912. A specimen was brought to the museum of the University of Colorado on Feb. 10, 1910.

***Glaucidium gnoma pinicola*.** ROCKY MOUNTAIN PYGMY OWL.—This small owl was fairly common in the city of Boulder from the first week of January to the middle of February, 1912. One bird was found dead and others were observed in various parts of the city; the number of individuals of course may not have been over three or four, as they were observed singly. On two occasions (at 8 A. M.) I saw this owl feeding on a bird about the size of an English Sparrow. They appeared to be active at all times of the day.

Picoides americanus dorsalis. ALPINE THREE-TOED WOODPECKER.— One was observed on the pine mesas near Boulder at an elevation of about 5800 feet on December 17, 1911, and on January 7, 1912 (probably the same individual).

Asyndesmus lewisi. LEWIS'S WOODPECKER.— A few birds remain all winter in the orchards and cottonwoods of the plains in Boulder Co. I have a few records for December, February, and March.

Zonotrichia leucophrys gambeli. GAMBEL'S SPARROW.— During the three past winters I have observed a small flock of Gambel's Sparrows wintering near a sheltered outcrop of sandstone on the plains east of Boulder. A specimen was taken for record on February 18, 1912.

Melospiza melodia montana. MOUNTAIN SONG SPARROW.— I have found this sparrow at Tolland, 9000 feet, in the middle of July, though not as numerous as the white-crowned and Lincoln's Sparrow which frequent that Park in large numbers.

Bombycilla cedrorum. CEDAR WAXWING.— On September 9, 1910, with Mr. H. C. Williams, I saw five or six in City Park, Denver. On September 11, 1910, in Boulder Cañon, near Boulder, I saw three Cedar Waxwings feeding on the berries of crataegus. These are the only records of this species that I have.

DeAdroica townsendi. TOWNSEND'S WARBLER.— In September, during the fall migration, I have found this warbler to be not uncommon in Boulder Co. I have noted it in varying numbers from August 28 to September 28.

Catherpes mexicanus conspersus. CAÑON WREN.— A nest with young was found on July 23, 1911, in the same crevice that contained the nest recorded in 'The Auk,' 1911.— NORMAN DEW. BETTS, Boulder, Colo.

Correction.— We regret very much to state that two of the records published in our 'Notes from Eastern Alberta,' Auk, Vol. 28, No. 4, Oct., 1911, have since proved erroneous: *Steganopus tricolor* proved referable to *Lobipes lobatus*, and *Macrorhamphus griseus griseus* to *scolopaceus*. Prof. W. W. Cooke kindly determined these specimens.

We moreover do not wish to be responsible for the three following records,— *Ammodramus savannarum bimaculatus*, *Anthus spraguei*, and *Icterus spurius*, as they are apparently new for Alberta (Prof. W. W. Cooke in *litteris*). These records are obviously of no value as we did not save the skins, but depended upon the more or less brief descriptions of a handbook in identifying them.— WINTHROP S. BROOKS, and STANLEY COBB, Milton, Mass.

Birds and the Cotton Scale.— I notice in the January Auk, p. 113, an account of birds eating the "Chinese Cotton Scale" in Colorado Springs. Why 'Chinese' I do not know; the insect in question is *Pulvinaria innumerabilis* Rathvon, common in the United States. Sanders has recently considered it identical with the European *P. vitis*, but it is probably distinct,

and native in America. In any event, it is not Chinese. Newstead in England found that the species of *Parus* fed freely on the immature females of the closely related *Pulvinaria ribesia*. The females of this group of *Pulvinaria* lay their eggs (to the number of a thousand or more) in a mass of white cotton-like wax, which adheres to whatever touches it. Hence the insect is aided as well as injured by birds, for the ovisacs adhere to birds' feet, and the eggs are thereby carried from tree to tree.—T. D. A. COCKERELL, *Boulder, Colorado*.

Ornithological Notes of Rafinesque in the Western Review and Miscellaneous Magazine, Lexington, Ky.—The following are supplementary to my article in 'The Auk', April, 1912, p. 191. They occur in meteorological articles by Rafinesque in the "Western Review and Miscellaneous Magazine," as follows:

Vol. II, No. 2, p. 123. "*Animals*. On the 9th was seen the first *Phaleria* or butterfly. On the 15th heard the Blue bird, or *Sylvia Sialis*, the harbinger of spring."

[Dated] "Transylvania University, 1st March, 1820."

Vol. II, No. 5, p. 311. "*Animals*. The first Martins were seen in the snow storm of the 2d; they became common the 6th. On the 11th were heard the first frogs."

[Dated] "Transylvania University, 1st May, 1820."

Vol. II, No. 3, p. 186. "*Animals*. Heard the Dove on the 19th. On the 25th the Black birds were already noisy."

[Dated] *Transylvania University*, 1st April, 1820."

Vol. III, No. 2, p. 127. *Animals*. On the 28th, the first flight of wild Geese was seen going South. All the Swallows and Martins disappeared with the first white frost."

[Dated] "*Transylvania University*, October 1st, 1820."

—SAMUEL N. RHODES, *Haddonfield, N. J.*

RECENT LITERATURE.

Chapman's Handbook.¹—For many years the student of birds in America received his inspiration and was guided in his early studies by 'Coues' Key,' and those of our ornithologists who are now nearing middle age have shaped their ideas of ornithology largely upon this classic work. Today however we are forced to realize that another and much larger generation of bird students has grown up whose guiding star has been not 'Coues' Key' but 'Chapman's Handbook,' and the broadening of the whole study, the widespread interest in the living bird as contrasted with the 'skin' is we think largely traceable to the influence of the latter work.

Just as the success of 'Coues' Key' called in time for a new edition so there has arisen an emphatic demand for a more modern 'Chapman,' which the author and publisher have fully met in the volume before us.

It is still the same handy reference volume which made the first edition so popular, but with an increase of 100 pages and with more as well as better illustrations. All of which make it the leading work of reference on bird life in eastern North America, not only for the amateur but for the professional ornithologist.

The introduction has been entirely rewritten and as it stands today is a model of concise statement, nowhere can one find so much information about birds in such a small space. The chapters and their subdivisions are as follows. I. Why we should Study Birds; II. A Word to the Beginner: Finding and Naming Birds; The Equipment of the Field Student; Collecting Birds, their Nests and Eggs; American Ornithological Societies; Current Ornithological Magazines. III. The Study of Birds in Nature: The Distribution of Birds; The Migration of Birds; The Voice of Birds; The Nesting Season; The Plumage of Birds; The Food of Birds; General Activities of the Adult Bird.

The author's wide field experience has enabled him to write upon these subjects largely from personal knowledge which adds materially to the value and interest of the essays. A most important feature moreover is the addition of a series of suggestions to the student under each heading and a bibliography of reliable publications dealing with subject under discussion, which serves as a guide to anyone who desires to pursue his studies

¹ Handbook of Birds of Eastern North America with Introductory Chapters on the Study of Birds in Nature | By | Frank M. Chapman | Curator of Ornithology in the American Museum of Natural History | Fellow of the American Ornithologists' Union | Foreign Member of the British Ornithologists' Union, etc. | With full-page Plates in colors and black and white | By Louis Agassiz Fuertes and Text-cuts by Tappan Adney and Ernest Thompson Seton | Revised Edition | New York and London | D. Appleton and Company | 1912. 12 vo. pp. i xxix + 1—530. pll. I—XXIV, figs. 1—136. Library Edition \$3.50 net., Pocket Edition, flexible covers, \$4.00 net.

farther along special lines. The second portion of the work, 'The Birds of North America east of the Ninetieth Meridian' follows the original edition but certain portions have been revised or rewritten, nesting dates have been added and the distribution and nomenclature have been revised according to the third edition of the A. O. U. Check-List.

The bibliographic feature is also carried through this part of the work and after many species are added the titles of important papers relating to them.

The admirable illustrations especially those by Fuertes add greatly to the usefulness of the book. The color plates of the plumages of the Orchard Oriole, Bobolink, and Scarlet Tanager make the successive changes so clear to us that a description seems scarcely necessary, while the plate of the Thrushes should solve for the bird student of the future any difficulties in their identification.

It remains only to mention the colored faunal map inside the cover, the 'Historical Review' and 'Plan of the Work,' which follow the preface, and the extended bibliography of faunal papers arranged according to states and provinces which closes the volume.

The prophesy of the reviewer of the original edition of the 'Handbook' that it was 'marked for a career of extended usefulness' has been abundantly realized and for the present volume we anticipate the same success but in even greater measure.— W. S.

Eagle Clarke's 'Studies in Bird Migration.'¹— For nearly thirty years the name of William Eagle Clarke has been closely identified with the study of bird migration in the British Isles. As one of the members of the British Association's 'Committee on the Migration of Birds' he prepared the five reports which resulted from investigations of this body, and now in two handsome volumes, he presents the results of his life work on this subject.

With the exception of the first two chapters the work deals entirely with the author's studies and conclusions. Chapter I is entitled, Some Ancient and Antiquated Views and Chapter II, Some Modern Views. While the latter does not pretend to be a résumé of the literature of the subject, the writings of a number of important students of migration are referred to, and it is rather remarkable that no mention whatever is made of the reports of Prof. W. W. Cooke issued by the U. S. Department of Agriculture. It is likewise remarkable that Dr. J. B. Watson's experiments with the Noddy and Sooty Terns on the Dry Tortugas are quoted from a review by Mr. Chapman in 'Bird Lore' while Dr. Watson's name is not even men-

¹ Studies in Bird Migration | By | William Eagle Clarke | Keeper of the Natural History Department, the Royal Scottish Museum | With Maps, Weather Charts, and Other Illustrations | Vol. I | London | Gurney and Jackson | Edinburgh: Oliver and Boyd | 1912 — 8vo, Vol. I, pp. i-xvi + 1-323; pll. I-IX. Vol. II, pp. i-viii + 1-346, pll. X-XXV. Price 18s. net.

tioned. Mr. Eagle Clarke attributes the origin of the migration of birds to the failure of the food supply on the approach of cold, but adds that today "the migratory habit has become part and parcel of their lives, through countless ages of practice." He considers, as Dr. Watson's experiments have proved, that migration is accomplished "through a special sense of direction unconsciously exercised" or as Professor Newton phrased it by "inherited but unconscious experience." He points out the familiar routes across the Mediterranean all supposed to be due to following the lines of former land bridges, but makes no mention of the route across the Gulf of Mexico which Prof. Cooke seems to have pretty well proven and which certainly follows no such line, crossing as it does the deepest portion of the Gulf. The Chapters covering bird migration in the British Isles are full of interest and replete with detailed data. These chapter headings are as follows: III. The British Isles and their Migratory Birds; IV. The Geographical Aspects of British Bird-Migration; V. Round the Year among the British Migratory Birds: Spring; VI. Autumn; VII. Winter; VIII. Weather Influences: The Meteorology of Bird-Migration; IX. Migration of the Swallow; X. Fieldfare; XI. Wagtail; XII. Song Thrush; XIII. Skylark; XIV. Lapwing; XV. Starling; XVI. Rook.

Most interesting is the account of the east and west migration into England from the valleys of the Rhine, Maas and Schelde. The birds actually fly *northeast* from the highlands bordering the Alps on the north, down the river valleys and across to southern England where the winter climate is milder; so that they winter in a higher latitude than that in which they nest. In the case of the Rooks and certain other species, Mr. Eagle Clarke states that part of those which breed in England arrive from the south in February and March, while at the same time, those of Central Europe which wintered in southern England are leaving that country for their breeding grounds on the headwaters of the Rhine.

Those who keep yearly records of the arrival of birds in America will be interested in comparing their lists with those which our author has prepared for the British 'harbingers of spring.'

The last ten chapters deal with Mr. Eagle Clarke's sojourns on light-ships, lighthouses and remote islands on the British and Scottish coasts, while pursuing his studies. These are as follows: XVII. A Month on the Eddystone; XVIII. A Month on the Kentish Knock Lightship; XIX. Fair Isle, the British Heligoland; XX. A Year with the Migratory Birds at Fair Isle; XXI. The Birds of Fair Isle; XXII. Bird Migration at St. Kilda; XXIII. The Birds of St. Kilda; XXIV. The Flannan Isles; XXV. Sule Skerry; XXVI. Isle of Ushant and Channel Islands. These chapters furnish most interesting reading and a wealth of information. The birds of many of the localities had never been previously studied so that the lists and observations have an interest in addition to that which attaches to the migratory movements.

Mr. Eagle Clarke's 'Studies' will take their place among the noteworthy contributions to the study of Bird Migration, and we can recom-

mend them to all interested in the subject. They are moreover admirable pieces of book making, the paper, typography and binding being all that could be desired, while a number of half-tones, photogravures and maps add to their attractiveness. We may mention especially the frontispiece to volume one from a painting by Marian Eagle Clarke showing the Eddystone Lantern on the night of October 12, 1901, with swarms of migrant birds hovering about in the brilliant illumination.—W. S.

Pycraft's 'A History of Birds.'¹—There is no recent book with which we are familiar that gives one a better idea of the breadth of ornithology than this volume and probably no book that the student of birds could read with more profit. Too many ornithologists are inclined to be narrow in their views of the study and to them such a work as Mr. Pycraft has produced will prove a revelation.

The amount of information that the author has managed to crowd between the covers of his book is amazing and no matter what the particular branch of ornithology in which we may be interested we are bound to find here illustrations that are new and comments that are suggestive. We may of course be able to pick out weak points in the treatment of certain subjects to which the author has never given especial study, and a few of his quotations may be from sources not thoroughly reliable, but slight delinquencies are inevitable in a work of such broad scope, and its general excellence and reliability are remarkable. Mr. Pycraft's keynote in this work is evolution; and he considers almost every conceivable phase of the relationship of birds to their environment and to one another.

His theories are often highly original and while there may be room for arguments on the other side, he never fails to present the matter in such a way as to provide ample food for thought. His chapters cover the following subjects. I. Introductory—General Structure of Birds; II–III. Phylogenetic—Origin and Relationship of Birds; IV. Ecological—Distribution, etc.; V. Seasonal Life; Effect of Light, Moisture and Temperature; VI. Migration; VII. Relations to Animate Environment; VIII. Peculiar Interrelations; IX. Phases of Social Life; X. Relations of the Sexes; XI. Nidification; XII. Concerning Eggs; XIII–XIV. Care of the Offspring; XV. Nestling Birds and what they Teach; XVI. The Life-History of Birds. XVII. Variation; XVIII. Acquired Characters; XIX. Natural Selection as Applied to Birds; XX. Artificial Selection; XXI. Sexual Selection; XXII. Isolation; XXIII–XXV. Structural and Functional Adaptations; XXVI. Convergent Evolution.

Mr. Pycraft's vast knowledge of avian anatomy enables him to cite

¹ *A History of Birds.* | By | W. P. Pycraft | Zoological Department British Museum. | With an Introduction by | Sir Ray Lankester, K. C. B., F. R. S. | and numerous Illustrations and Diagrams | Methuen and Co. | 36 Essex Street, W. C. London [1910]—Svo, pp. i–xxxi + 1–458, with 50 text illustrations and 37 plates, including frontispiece in colors. Price 10s. 6. net.

examples from the structure of various parts of the bird in every discussion of adaptation and development and these chapters impress us as the strongest. His treatment of geographic distribution is hardly up to date but it is difficult to treat this matter adequately in the short space allotted to it, and the same may be said of the chapter devoted to migration. All in all however, there is little to which exception can be taken in the plan and execution of the 'History of Birds.' It should be in every library and it cannot fail to broaden the views of the younger ornithologists and lead them into lines of research which will yield valuable results in the near future.—W. S.

Headley's 'The Flight of Birds.'¹—The serious study of bird flight brings ornithology into the domain of physics and mathematics and since the average ornithologist does not care to go very far into this field of research a book like the present will find a very general welcome, attempting as it does to explain the subject with as few technicalities as possible. Mr. Headley considers flight under several heads: Gliding, Stability, Motive Power, Starting, Steering, Stopping, The Machinery of Flight, Varieties of Wing and of Flight, Pace, Wind and Flight, Some Accessories. Numerous excellent illustrations are taken from photographs of flying birds in various positions and under varied conditions.

In considering the sailing of Gulls against the wind, so often observed from a steamer's deck, Mr. Headley states definitely that the birds are poised on a steady upcurrent of air over the stern of the vessel, caused by the wind striking the sides of the vessel at an acute angle. Mr. William Brewster after careful consideration of this theory dismissed it absolutely after finding that the Gulls sailed equally well, in advance of the vessel, a hundred yards behind, or fifty yards to windward (cf. 'The Auk,' 1912, p. 90). Therefore it would seem that the last word on this problem is yet to be said and it might be profitable as has been suggested to compare the Gulls to the sailing of an ice yacht which, paradoxical as it may appear, goes faster the nearer it is brought into the 'teeth of the wind.'

Mr. Headley's book is a welcome contribution to an interesting subject, the more so since with the aid of gliders and aeroplanes man is beginning to face the same problems which the bird has solved so successfully.—W. S.

Howard's British Warblers. Part VI.²—The latest installment of this beautiful work consists of colored plates of the Willow, Savi's, Rufous and Icterine Warblers with text relating to all but the last, while four photo-

¹ The 'Flight of Birds' By F. W. Headley, M. B. O. U. | Author of "The Structure and Life of Birds" | "Life and Evolution" &c | With Sixteen Plates | and Many Text Figures | Witherby & Co. | 326 High Holborn | London | 1912.—Crown 8vo., pp. 1-x + 1-163, with 16 plates and 27 text figures. Price 5s. net.

² The 'British Warblers' A History with Problems | of | their Lives | by H. Elliot Howard, F. Z. S., M. B. O. U. | Illustrated by Henrik Grönvold | London R. H. Porter | 7, Princes Street, Cavendish Square, W. | Price 21s. net.—Part 6. December, 1911.

gravure plates illustrate attitudes of the first two species during the period of courtship. In addition to the detailed life histories, considerable space is devoted in the Willow Warbler biography to a discussion of the probable cause of the early migration of certain species of warblers and also of the probability of the same pair of migrant birds mating in successive years. The author considers the latter highly improbable in species where the males precede the females in migration. The possibility of one or other perishing during the migrations is very great and if the male bird waited for the arrival of his last year's mate, many a male would remain unmated. The evidence seems to point to his mating with the first female to arrive in his neighborhood and this would seem most advantageous to the perpetuation of the species. There is also much of interest in the account of sexual excitement and display on the part of the male birds in the species treated. Both plates and text are fully up to the high standard set by the previous parts.—W. S.

Hartert's Vögel der paläarktischen Fauna.—The seventh part¹ of this notable work on the palæarctic Avifauna comprises the Swifts, Goat-suckers, Bee-eaters, Hoopoes, Rollers, Kingfishers, Woodpeckers, Cuckoos and part of the Owls. Owing to the strict adherence to the International Code the nomenclature takes on some changes and accords with the A. O. U. Check-List in genera which are found also in the Nearctic region. *Dryobates* long used in America is adopted for the small black and white woodpeckers and the efforts of our ornithologists in splitting up the North American forms of this genus are far excelled, no less than sixty species and subspecies being listed. *D. major* has sixteen races, and *D. minor* thirteen. *Picus* takes the place of *Gecin*us.

The following new forms appear in the main text or in annotations: *Caprimulgus europæus sarudnyi*, W. Turkestan; *Dryobates minor buturlini*, Italy; *D. hyperythrus marshalli*, N. W. Himalayas; *Picumnus innominatus malayorum*, Borneo; *P. i. avunculorum*, Nilgiri Hills; *Cuculus canorus bakeri*, Shellong, Khasia Mts.; *C. intermedius insulindae*, Kina Balu, Borneo.

All who have occasion to deal with palæarctic birds will congratulate Dr. Hartert upon the progress of his work.—W. S.

'A Hand-List of British Birds.'²—A little more than a quarter-century ago the American Ornithologists' Union, in an effort to establish uniformity

¹ Die Vögel der paläarktischen Fauna. Systematische Übersicht der in Europa, Nord-Asian und der Mittelmeerregion vorkommenden Vögel. Von Dr. Ernst Hartert. Heft VII (Bd. II, 1). Seite 833-960. Mit 30 Abbildungen. Berlin, 1912.

² A Hand-list of British Birds with an Account of the Distribution of each Species in the British Isles and Abroad. By Ernst Hartert, F. C. R. Jourdain, N. F. Ticehurst and H. F. Witherby. Witherby & Co., 326 High Holborn, London, W. C. 1912.—8vo., pp. i-xii + 1-237. Price 7s 6d. net.

in the names applied to American birds, published a Code of Nomenclature and a Check-List. The tenth edition of Linnæus's 'Systema Naturæ' was adopted as the starting point, trinomials were employed for the designation of subspecies, tautonymic names were admitted and a few other principles then looked upon as revolutionary were put into practice. 'The Ibis' in reviewing the publication regretted that the adoption of the tenth instead of the twelfth edition of Linnæus alone "disposes of the last chance of a scientific language in common with out brethren across the water." As our British friends had not been very successful in establishing a scientific language that had proved common even to the inhabitants of the British Isles, American ornithologists did not take this prediction too much to heart but looked forward with confidence to a time, that they felt sure must come, when the principles adopted in the A. O. U. list would become the basis for a list of British birds. For many years there seemed little chance of their hopes being realized, even though they had the satisfaction of seeing their Code almost in its entirety endorsed by the International Zoological Commission. Recently however, there have been encouraging signs, trinomials have appeared on the pages of 'The Ibis', and here and there time honored names of British birds have been ruthlessly overthrown in order to comply with the rules of the Code. It was therefore with more than ordinary interest that we received notice of the appearance of a new Hand-List of British birds, and with the volume before us we began to turn the pages with much speculation as to what they might disclose.

The motto on the very first page was encouraging "Nomenclature is only 'a means, not an end,' but without uniformity it is a confusion." How the late Dr. Elliott Coues would have relished this improvement upon the A. O. U. motto! The introduction clearly sets forth the lack of uniformity that has prevailed in the nomenclature of British birds, and makes an admirable plea for everyone to help in upholding "the strict letter of the law [as set forth in the International Code] rather than his own convenience, likes and dislikes." How rigidly the authors have lived up to their declaration is seen in the acceptance without a protest of the Brissonian genera, in accordance with a ruling of the Commission, although at least one of the authors was and no doubt still is bitterly opposed to recognizing them.

Turning to the list itself we see that our hopes have been fully realized; indeed we could well believe that we had the last edition of the A. O. U. Check-List before us! Trinomials appear on nearly every page and not only is the binomial name given at the head of each set of subspecies but it is repeated in cases where the species has not been subdivided, thus presenting absolute consistency which the A. O. U. Check-List does not.

As an example of the style and typography of the names we may quote from pages 41-42.

CERTHIA FAMILIARIS.

83. *Certhia familiaris brittanica* Ridg.—THE BRITISH TREE-CREEPER.

84. *Certhia familiaris familiaris* L.—THE NORTHERN TREE-CREEPER.

TICHODROMA MURARIA.

- 85.
- Tichodroma muraria*
- (L.).—THE WALL CREEPER.

SITTA EUROPEA.

- 86.
- Sitta europæa britannica*
- Hart.—THE BRITISH NUTHATCH.

PARUS MAJOR.

- 87.
- Parus major major*
- L.—THE CONTINENTAL GREAT TITMOUSE.

- 88.
- Parus major newtoni*
- Prazak.—THE BRITISH GREAT TITMOUSE.

Under each numbered form is given the original reference and type locality, the latter restricted when necessary; and references to the last edition of Yarrell's 'History of British Birds', and Saunder's 'Manual'. Then come three paragraphs on distribution: (1) Distribution in England and Wales, in Scotland and in Ireland; (2) Migrations in the British Isles; (3) Distribution Abroad;—all of them very full. As seen in Nos. 83 and 86 above, original spelling is strictly adhered to. Occurrences that are not fully authenticated or are perhaps escaped cage birds are given in brackets in their proper place in the list and are unnumbered, but "vagrants" of apparently natural occurrence take their regular position and number. Important changes in nomenclature from the later British lists are explained in footnotes.

The only important omission to our mind is that of the generic heading, as without it we cannot always determine the source from which the generic name is taken or which species is regarded as the type.

The list comprises 469 forms—species or subspecies—and as we run over the names we are struck with the remarkable accord with the A. O. U. List. Not only are the Jaegers named as Americans have for twenty-five years maintained that they should be named, but *Colymbus* actually appears for the Grebes and *Gavia* for the Loons! There are about 190 cases where the same bird occurs in both lists or where the American and British forms differ only subspecifically, and of these 121 have exactly the same binomial name in the two works, while in 63 others the specific name is the same but the generic names differ owing to the tendency of the British authors to 'lump' genera. Twenty-four additional genera occur which have different species on the two sides of the Atlantic, and for all of them the same names are employed in the two lists.

The 'lumping' of genera is particularly noticeable in the ducks and shore-birds. In the former, *Chaulelasmus*, *Nettion*, *Querquedula*, and *Mareca* are included in *Anas*, while *Netta*, *Marila*, *Clangula* and *Charitonetta* of the A. O. U. List are united under *Nyroca*. The reduction of *Acanthis*, *Spinus*, *Astragalinus*, and *Carduelis* to one genus is also rather startling. These cases, as well as six instances where American birds are treated as subspecies of Old World species, are matters of individual opinion and cannot be covered by any Code. On purely nomenclatural questions the two lists are in remarkable accord, there being only thirteen cases of difference in generic and five in specific names.

In the substitution of *Oenanthe* for *Saxicola*; *Hydrobates* for *Thalassodroma*, *Tyto* for *Aluco*; *Canutus* for *Tringa*, *Tringa* for *Helodromas* and

Pterodroma for *Æstrelata* the British List is probably correct. *Harelda* for *Clangula* depends upon whether or not Oken's names are accepted, while the use of *Eremophila* and *Ægolia* depend upon the claim that the prior names *Eremophilus* and *Ægolia* do not invalidate them. In the use of *Bombycilla* for *Ampelis* and *Hirundo* for *Chelidon* the A. O. U. List is unquestionably right. The first author to fix a type for *Hirundo* was Gray, 1840, who designated *H. rustica*. The International Code does not recognize type fixing by restriction except where there are only two species in the genus, so Forster's action in 1817 amounts to nothing. The case of *Grus* vs. *Megalornis* will probably have to be decided by the Commission.

In the case of specific names *hyperboreus* Gunn. for the Glaucous Gull and *alba* Gunn. for the Ivory Gull are rejected; *ischegrava* Lapech. for the Caspian Tern is considered perfectly identifiable; *æsalon* Tunnstall for the Merlin is rejected as a nomen nudum and *funerea* L. for Tengmalm's owl, as unidentifiable.

This comparison shows that it will now be very easy for American and British ornithologists to come together on matters of nomenclature and that the diversity in names at present is due mainly to different views as to the limits of genera.

We congratulate the authors of the British Hand-List upon the character of their work, and upon the great strides that they have made toward uniformity of nomenclature. Let us hope that all British ornithologists will hearken to the plea that they make and adopt the names here set forth in all future writings upon British birds.—W. S.

Horsbrugh's 'The Game-Birds and Water-Fowl of South Africa.'¹

—The first part of this recently announced work is before us. It is beautifully printed on heavy paper, and the plates, printed in colors on egg-shell surface paper, are exceedingly delicate and portray the minute details of plumage characteristic of game-birds with great fidelity, even though the artist has not attempted the life and action, and originality of pose, which we are familiar with in the work of Fuertes and some of our other bird artists.

This part consists of sixteen plates portraying ten Bustards, two Thick-nees, three Snipe and a Francolin with a page or two of text to each. This comprises synonymy, local names, brief description, distribution, and a general account of habits and abundance.

The author is apparently not an advocate of excessive generic subdivision and the Bustard's referred to seven genera in the British Museum Catalogue here all appear under the classic name *Otis*.

¹ The | Game-Birds and Water-Fowl | of South Africa | By | Major Boyd Horsbrugh | (Army Service Corps) | Member of the British Ornithologists' Union and South African | Ornithologists' Union; Fellow of the Zoological Society of London | with | Coloured Plates | By | Sergeant C. G. Davies | (Cape Mounted Rifles) M. B. O. U., M. S. A. O. U. | To be Completed in Four Parts | Part I. | London: | Witherby & Co., 326 High Holborn W. C. | March, 1912. | pp. 1-40, pl. 1-16.

The work should prove an important reference volume to ornithologists and invaluable to the sportsman of South Africa.— W. S.

Mathews' Austral Avian Record. No. 2.¹— In this number Mr. Mathews gives brief diagnoses of 108 new subspecies of Australian birds and descriptions of the eggs of 137 forms. A few questions of nomenclature are also discussed: the proper name for the Broad-billed Sandpiper is shown to be *Limicola falcinellus* Pontoppidan, and the eastern race *L. f. sibirica* is added to the Australian fauna. Vroeg's Catalogue comes in for further discussion and Mr. Mathews adopts still another view as to how it is to be quoted. He regards most of the names in the Catalogue as *nomina nuda* but where possible quotes them from there rather than from the *Adumbratiunculae* and credits them to Vroeg!²— W. S.

Oberholser on the Edible-nest Swiftlets.³— In view of the large number of additional specimens of *Callocalia fuciphaga* that Mr. Oberholser has been able to examine since the appearance of his recent monograph of the genus, he is able to recognize ten instead of four geographic forms of this bird. Of these *C. f. amechana*, from the Anamba Island, *C. f. aerophila* from Nias Island, *C. f. mearnsi* from Luzon and *C. f. tachyptera* from Guam, are here described as new.— W. S.

Clark on 'The Ontogeny of a genus.'⁴— In this timely paper Dr. Clark emphasizes the fact that systematists do not devote the careful study to genera that they bestow upon species and subspecies and makes a plea for careful analyses to determine "what genera are logical and valid and what are mere artificial aggregations, brought together solely for the sake of convenience." The origin and development of genera are then discussed as well as the effect of geographic and ecological barriers to their distribution.— W. S.

Wright on Birds of the Jefferson Region.⁵— This is a carefully annotated list of 188 species based mainly upon the author's observations during the past twelve seasons together with those of Mr. F. B. Spaulding.

¹ The Austral Avian Record. A Scientific Journal devoted primarily to the study of the Australian Avifauna. Vol. I, No. 2. April 2, 1912. Witherby & Co. London. Price 1s. 6.

² Cf. 'The Auk,' April, 1912, p. 205.

³ A Revision of the forms of the Edible-Nest Swiftlet, *Callocalia fuciphaga* (Thunberg). By Harry C. Oberholser. Proc. U. S. Nat. Museum, Vol. 42, pp. 11-20, March 6, 1912.

⁴ The Ontogeny of a Genus. By Austin H. Clark. The American Naturalist, Vol. XLV, June, 1911, pp. 372-374.

⁵ The Birds of the Jefferson Region in the White Mountains New Hampshire [vignette] by Horace W. Wright Published by Manchester Institute of Arts and Sciences Manchester, N. H. 1911. [= Vol. V, Part I of the Proceedings of the Institute], pp. 1-126.

The region covered comprises the town of Jefferson and portions of the towns of Lancaster, Whitefield, Carroll and Randolph and the northern and western slopes of the Presidential Range to the Crawford House Plateau. An introduction furnishes a description of the physical features of the region and the birds characteristic of the several areas. The changes wrought by lumbering and fire, now familiar features of all wooded country, are referred to, resulting here in the decrease in the numbers of the Canada Spruce Partridge, the Three-toed Woodpeckers, Canada Jay, Winter Wren, Brown Creeper, Red-breasted Nuthatch and Hudsonian Chickadee and the increase of the Meadowlark, Yellow Warbler, Wilson's Warbler, Wood Thrush, Prairie Horned Lark, Red-winged Blackbird, Field Sparrow, and House Wren.

The annotations contain many observations of interest and the list as a whole will prove most welcome not only to New Hampshire ornithologists but to many bird students from all parts of the country who are accustomed to visit the White Mountain region.— W. S.

Dill and Bryan on Laysan Island.¹— This well illustrated pamphlet describes a visit to Laysan, the principal island of the Hawaiian reservation, for the purpose of investigating the damage done by a party of twenty-three foreign plumage hunters who were arrested on the island in 1910, after they had destroyed over 250,000 birds, largely Albatrosses. Fortunately the poachers had been able to despoil only part of the island and it is considered that with immunity from destruction in the future the birds will regain their former numbers. The report shows the same birds present as were recorded by Dr. W. K. Fisher in 1902 with the addition of Bulwer's Petrel, *Bulweria bulweri*, and the Sooty Petrel, *Oceanodroma tristrami*. Estimates place the present bird population at about one million individuals of which one third are Sooty Terns and nearly a third Albatrosses, *Diomedea immutabilis*, and *D. nigra*.

The narrative and list of species are by Prof. Dill, while Prof. Bryan, whose familiarity with the islands and knowledge of the previous slaughter on Midway and Marcus Islands, especially fitted him for the task, has reported in detail on the present and past conditions and on the best methods to pursue in the future protection of the birds. Mr. H. W. Henshaw has contributed a brief summary of this report to the Yearbook of the Department of Agriculture.²— W. S.

¹ Report on an Expedition to Laysan Island in 1911. Under the Joint Auspices of the United States Department of Agriculture and the University of Iowa. By Homer R. Dill, Assistant Professor of Zoology in the State University of Iowa and Wm. Manson Bryan, Professor of Zoölogy in the College of Hawaii. Bulletin 42. Biological Survey, U. S. Dept. of Agriculture. Washington, 1912.

² Our Mid-Pacific Bird Reservation. By Henry W. Henshaw. From the Yearbook, U. S. Dept. Agr., 1911, pp. 153-164.

Economic Publications of the U. S. Department of Agriculture.—Several important papers have been published recently by the staff of the Biological Survey, U. S. Department of Agriculture, relating to economic ornithology. One by Ned Dearborn deals with the English Sparrow.¹ Continued investigation has only emphasized the fact that these birds are everywhere a nuisance,—noisy, filthy and destructive, and the little good they do in destroying some noxious insects is far overbalanced by the damage they inflict. This bulletin deals mainly with the best methods for their destruction and recommends the continual breaking up of their nests and the trapping of the old birds, as the most efficacious means for lessening their numbers. Several styles of traps are figured and described in detail.

A bulletin on the economic status of nineteen common Game, Aquatic and Rapacious birds is the joint work of W. L. McAtee and F. E. L. Beal,² though the former author is responsible for the bulk of the sketches. As in other similar publications the distribution and general habits of the several species are briefly considered, while the results of the study of stomach contents are given in considerable detail. Several birds are here treated which have not been included in previous publications of the Department.

Mr. W. L. McAtee has another paper in the Yearbook of the Department of Agriculture dealing with the 'Bird Enemies of the Codling Moth.'³ He finds that birds are the most effectual natural enemies of this pest and 'in some localities they destroy from 66 to 85 per cent of the hibernating larvæ.' The most useful species are the Downy Woodpecker, Black-headed Grosbeak, Bullock's Oriole and Bush-Tit.—W. S.

The Food of Birds in India.⁴—Under this title Mr. C. W. Mason brings together most of the recorded knowledge upon the food of Indian birds, and presents also field observations of his own, as well as the results of the examinations of 1325 stomachs. The work is edited by the Imperial Entomologist, H. Maxwell-Lefroy, who adds a section summarizing the value of birds to agriculture. Mr. Mason has done a very useful thing in collecting the notes on bird food from the 3 most important Indian scientific journals, and from 10 standard reference works on the avifauna of India. It greatly lightens the task of future students of economic ornithology in India. Moreover the generous leaven of new material gives point and vitality to the whole paper.

"From the economic point of view," says Mason, "the scientific identi-

¹ The English Sparrow as a Pest. By Ned Dearborn. U. S. Department of Agriculture, Farmers' Bulletin, 493, 1912, pp. 1-24, figs. 1-17.

² Some Common Game, Aquatic, and Rapacious Birds in Relation to Man. By W. L. McAtee and F. E. L. Beal. U. S. Department of Agriculture, Farmer's Bulletin, 497, 1912, pp. 1-30, figs. 1-14.

³ Bird Enemies of the Codling Moth. By W. L. McAtee. Yearbook U. S. Department of Agriculture for 1911 (1912), pp. 237-246. (Also separate.)

⁴ Mem. Dept. Agr. India. Ent. Ser. Vol. III, Jan., 1912, 371 pp.

fication of birds' food is of the utmost importance, and especially with regard to the insect portion. Economic ornithology is, therefore, a sister science to economic entomology, just as much or perhaps even more so than botany. To aid agricultural interests, nature is called in practically and artificially, and every effort should be made to use such helps from every possible source. Wild birds are the source in question here. . . . We can . . . by encouragement of useful species and destruction of harmful ones, check the attacks of insects on crops, and enable the country to increase crop outturns, and in every way benefit agricultural and therefore the country's interest." (p. 5).

It is interesting to note that Mr. Mason has reached the same conclusion about several points as have economic investigators in the United States. For instance, his opinion as to the low value of generalized statements founded on field observations on the food of birds agrees with our experience. He properly esteems field observation, however, as a valuable supplement to stomach examination. Mason doubts the value of observations on caged birds, saying "if the natural food is but vaguely known, we learn practically nothing by this method." (p. 15.) Indian birds, like those of the United States, are very fond of grasshoppers. "They are eaten by practically every species of insectivorous bird, and form one of the main supplies from which birds in India draw their insect food." (p. 325.) Fondness for Scarabæidæ and weevils is also characteristic of birds of both countries. Mason says furthermore that "butterflies do not form any appreciable proportion of the food of any . . . species of bird," a conclusion agreeing perfectly with experience in the United States. We have been informed however by supporters of the mimicry theory that in the tropics all is different and that butterflies are freely eaten by birds. Mason's data from the examination of the stomachs of tropical birds is by no means the only evidence that these statements are highly speculative. In commenting on Frank Finn's experiments in feeding butterflies to birds, which Finn at the time thought afforded proof that there is a natural taste for butterflies among birds, Mason justly remarks "they have little importance to economic ornithology since most of the experiments were conducted with caged birds, these therefore being under unnatural conditions." (p. 338.)

Mason makes some very justifiable remarks on the economic value of seed-eating birds, expressing views which may be more or less justly applied in the United States. He says: "In India I consider a bird eating weed seed as of no value whatever. They may keep weeds down to a certain extent, but this is of minor importance in a country where labour is cheap and where farming is not practised on such intensive lines as elsewhere. Even in intensive cultivation we cannot rely on weeds being kept down by birds and the expense of cultivation to eliminate weeds is, I believe, not reduced in the slightest by the action of birds." (p. 9.) In addition to this he says: "We can attach little, if any, importance in India to weed-seed or weed-eating birds; we attach no more importance to them than we do to weed eating insects. As a rule a weed-seed eating bird is spoken of as

beneficial, while we seldom hear it said or see it stated that an insect with identically the same food material is beneficial. It is needless to say that both the birds and the insects have the same economic importance." (p. 309.) This point is very well taken, and brings us face to face with the dilemma of rating many weevils as beneficial when they are certainly potentially injurious and cases of the transfer of their attentions to cultivated plants are not rare. It is a more practicable as well as more correct course to follow Mason in rating them as well as the seed-eating birds as of neutral significance.

We are rather surprised to learn that Mason considers ants as of neutral importance. They are far from so being in the American tropics, where they are practically the "lords of creation." Even in the United States we believe their bad qualities are preponderant. Mason differs decidedly from American investigators regarding the value of the volumetric method of estimating the contents of birds' stomachs, and we shall discuss this important question at length elsewhere.

Part IV of this report, a summary of the value of birds to agriculture is of great interest, as being written by the eminent economic entomologist, H. Maxwell-Lefroy. Some of his conclusions are as follows:

"One has only to read the lists of the food of beneficial species to get an idea of the immense part they play in reducing insect damage. Nearly all insects have special enemies such as parasites which attack each individually, but which produce alternative abundance and scarcity of each insect; that is, with the natural action of the special checks such as parasites, you get alternate 'Waves' of insect pest and parasite; this is where the birds' importance is shown; they are not restricted, they eat many kinds of insects and when a pest has for the time got ahead and is abundant the birds are there to feed on it just because it is abundant and because at one time one is abundant, at another time another is, and the birds eat them all. To put it figuratively they cut off the tops of the waves and tend to keep them all at a uniform level, none being ever destructively abundant. In my opinion from man's point of view this is the special function in nature of birds and if the bird population is small outbreaks of insects are frequent." (p. 364.)

"The impression one gains by reading the detailed records and by correlating it with one's knowledge of the insects is of a ceaseless war waged by birds, not as a war but as the daily search for food, on edible insects which are mainly those destructive ones which have a compensating very high ratio of increase and which are ceaselessly breeding and increasing against the ravages caused in their numbers by their enemies." (p. 368.)

"It is difficult to overestimate the value of birds as a class and their function seems to be, not so much the keeping down of individual destructive species (which is done by special parasites each destructive insect has), as the cutting off of the crest of the wave of increase, the checking of those insects which by favour of climatic or other influence elude their checks and become abundant." (p. 369.)

Coming from so distinguished an entomologist, these conclusions carry much weight, and they are well worth the attention of certain economic entomologists of the United States, who have expressed very different views of the relative importance of birds and parasitic insects.— W. L. M.

Bryant, on Relation of Birds to an Insect Outbreak in California.¹—

This valuable economic paper deals with an outbreak of a butterfly, *Eugonia californica*, which swarmed over portions of California and the larvæ of which defoliated the Snow-brush and Buck-brush, two species of *Ceanothus*. Mr. Bryant's investigations show that five species of birds fed upon the butterflies. Brewer's Blackbird (*Euphagus cyanocephalus*) being the most important and consuming 95 per cent of all the butterflies eaten by birds. Butterflies seem to be rarely eaten by birds under normal conditions and the change of food in this instance is interesting as illustrating how valuable a bird not usually of economic importance may become under extraordinary conditions. The great benefit entailed in the destruction of female butterflies before or during ovipositing as compared with the destruction of larvæ is also pointed out by the author and he estimates that of one Brewer's Blackbird destroyed 100,000 butterflies in a month and his observations seem to support him. If one third of these were females, the destruction of eggs would amount to 336,000! — W. S.

Economic Ornithology in Recent Entomological Publications.—

The following reviews relate exclusively to publications of the U. S. Bureau of Entomology, hence the name of that office is not repeated in the reference. The first article,² in point of date of issue, which we desire to note deals with the bill-bug (*Sphenophorus callosus*). This species, which does great damage to corn in many states, is commonly known in the Carolinas as the "curlew-bug." This appellation refers to a point in common between the bird and the beetle — a long curved beak. One bird enemy of the curlew-bug, the Nighthawk, is mentioned on the authority of the Biological Survey. The finding of not only this species, but of several other *Sphenophorus*, in stomachs of Nighthawks, has a bearing on a debated point, i. e., whether these beetles fly. There is no doubt that most if not all of those eaten by the Nighthawk are taken on the wing.

The false wireworms of the genus *Eleodes*, family Tenebrionidæ, are said³ to do more damage to newly planted grain in the northwestern states than any insect pests other than the true wireworms of the family Elateridæ. The Sage Hen, the Burrowing Owl, and Butcherbird are said to feed upon them and Brewer's Blackbirds often follow the plow to pick up the larvæ and pupæ. Western Bluebirds were seen to feed on larvæ which had

¹ The Relation of Birds to an Insect Outbreak in Northern California during the Spring and Summer of 1911. By Harold C. Bryant. The Condor, Vol. XIII, Nov., 1911, pp. 195-208.

² Webster, F. M. The so-called "curlew-bug." Bull. 95, Pt. IV. April 10, 1912.

³ Hyslop, J. A. Bull. 95, Pt. V, April 22, 1912.

been driven to the surface by a heavy rain. From observations and experiments upon domesticated and other confined birds it was learned that chickens, ducks, and the Reeves and Silver Pheasants will eat the *Eleodes*, and that turkeys and the Golden, and Lady Amherst Pheasants refuse them. The author remarks however, that the latter birds were "quite annoyed by our presence, and might have eaten the beetles had they not been frightened." The account of the natural enemies includes also a list of 13 species of birds which the Biological Survey has found to feed upon adult *Eleodes*.

In his account of 'Two destructive Texas ants,'¹ Mr. W. D. Hunter inserts a list of the known bird enemies of the agricultural ant (*Pogonomyrmex barbatus molefaciens*). This list also is taken from Biological Survey records (with the exception of one name), and includes 8 species of birds.

The 'Preliminary report on the alfalfa weevil,'² gives a list of the vertebrate enemies of this new, but important pest, based on the work of Mr. E. R. Kalmbach of the Biological Survey. This represents the results of one season's field work on the relations of birds to this weevil. Thirty-one species are mentioned. A noteworthy point brought out by this investigation is that English Sparrows are among the most effective enemies of the pest, practically rearing their young on a weevil diet. Mr. Kalmbach writes that this season these birds are fully equalling last year's performance.— W. L. M.

The Food of Birds in Scotland.— Miss Laura Florence publishes in the Transactions of the Highland Agricultural Society³ detailed results of the examinations of the alimentary tracts of 616 birds representing 74 species. Since the contents of the intestines as well as of the stomachs were studied, the author is able to present data on the imperfection of digestion in some cases and to indicate possibilities in the distribution of seeds and insect eggs. No general conclusions are drawn, and the results for each species are only very briefly summarized. The detailed information is worthy of record, however, and will no doubt be very welcome to all Britons interested in economic ornithology.

The identity of several of the birds with United States species and the recurrence of many familiar seed and insect names, make an American feel much at home while reading the paper.— W. L. M.

Scott and Sharpe on the Birds of Patagonia.— The third installment of the report on the birds of the Princeton University Expedition to Patagonia⁴ is presented with the same wealth of illustrations and breadth

¹ Circular 148, April 26, 1912.

² Bull. 112, May 14, 1912.

³ Fifth Ser., Vol. XXIV, 1912, pp. 180-219.

⁴ Reports of The Princeton University Expeditions to Patagonia, 1896-1899, J. B. Hatcher in charge. Edited by William B. Scott. Volume II — Ornithology, Part III. Charadriidæ-Anatidæ. By William Earl Dodge Scott associated with R. Bowdler Sharpe. Princeton, N. J. — Stuttgart. Pp. 345-504, text figs. 175-252, pl. 1.

of treatment found in the two preceding sections. The orders treated in their entirety are the Ardeiformes, Phoenicopteriformes and Anseriformes, while the first few pages are taken up with the last of the text on the Charadriiformes. The account of the habits of the Steamer Duck (*Tachyeres cinereus*), compiled from numerous sources, and the plate of three progressive stages of the downy young of the same peculiar species are of particular interest.

Owing to the death of both of the authors of the third and preceding portions of this report the preparation of the remaining installments has been placed in the hands of Mr. Witmer Stone, who also read the proof-sheets of the present section, although as presented it is entirely the work of the deceased authors.— J. A. G. R.

Kuser's Birds of Somerset Hills.¹—In this dainty little volume Mr. Kuser has presented the results of his studies of the birds of Somerset County, northern New Jersey. The species are arranged according to their haunts, and their habits and plumages briefly described, while there are colored illustrations from paintings by Mr. C. A. Reed. There are special chapters on The Increase and Decrease of Birds, My Best Day's Record — 64 species, Calendar of Bird Migration in Somerset Hills, Terms used to denote the Abundance or Rarity of Birds, List of Birds Observed in the Somerset Hills, and The Horrors of the Taking of Aigrettes. The book is tastefully gotten up and beautifully printed and the subject matter cannot fail to interest its readers in birds and their protection.— W. S.

Murphy on Birds of Prospect Park, Brooklyn.²—Mr. Murphy contributes a nominal list of 147 species of birds observed in Prospect Park, Brooklyn, by members of the 'Bird Lovers' Club of Brooklyn' during the past six years. Twelve of these have not been recorded from Central Park, New York, while eighteen species seen by observers in the latter locality have not been found in Prospect Park.

The list will be interesting to those engaged in observing birds in other public parks and reservations in or about our large cities.— W. S.

Bragg's Supplement to the Birds of South Carolina.³—This list is intended as supplementary to Mr. Arthur T. Wayne's 'Birds of South Carolina,' published by the Museum in 1910. It contains notes on ninety-six species, giving additional records, exceptional dates of occurrence and

¹The Birds of Somerset Hills. By John Dryden Kuser. Published by the Author. 1912. Svo., pp. 1-160, pl. 22 and a map.

²The Birds of Prospect Park, Brooklyn. By R. C. M(urphy). The Museum News, published by the Brooklyn Institute of Arts and Sciences, Vol. 7, No. 8, May, 1912.

³Birds of South Carolina. Supplement. By L. M. Bragg. Bull. Charleston Museum, Vol. 8, Nos. 2-3, Feb. and March, 1912.

other supplementary data. Notes published elsewhere are included with proper references in order to make the supplement as complete as possible.—W. S.

Todd on New Neotropical Birds.¹—In the course of identifying the South American birds recently acquired by the Carnegie Museum, which by the way amount to some six thousand skins, Mr. Todd has found a number which are apparently undescribed.

Mr. Carriker's Venezuela collection yields the following, *Arremonops tocuyensis*, *Sallator orenocensis rufescens*, *Schistochlamys atra aterrima*, *Compsothlypis pitiayumi elegans*, *Pheugopedius macrurus annectens*, *Troglodytes solitarius*, *Craspedoprion intermedius*, *Myiobius modestus*, *Myiochanes ardosiacus polioptilus*, *Myiodynastes chrysocephalus cinerascens*, *Machetornis rixosa flavigularis* and *Euchlornis aureipectus festiva*. From Trinidad is described *Tangara guttata trinitatis*, from the Santa Marta district, Colombia, *Sporophila haplochroma* and *Penelope colombiana*. There are also described *Tangara guttata eusticta* from Costa Rica and *Piaya rutila panamensis* from Panama, the type of the latter being in the Museum of Comparative Zoölogy. Mr. Todd promises full accounts of the Carriker Venezuelan Collection and a collection made in Bolivia by José Steinbach; at an early date.—W. S.

Coward's 'The Migration of Birds.'²—This little book is intended as a popular treatise on the subject of bird migration and being obviously a compilation one does not look for anything original in its pages. It will undoubtedly give the novice much information on this interesting subject, but it is to be regretted that a little more discrimination was not shown in the weight given to the different sources of information, and that the author could not have shown more personal knowledge of his subject in his handling of it.

Gätke comes in for continual criticism, while statements of more favored authors are quoted as facts, whereas they had, in some cases, much better be regarded as theories still subject to confirmation. The speed of certain species of migrating birds in North America quoted from Prof. Cooke's papers is a case in point. No doubt his theory of the advance of the Robin may prove correct, but in view of the variability of records of arrival of various species at nearby localities, it will require much more data before we can be positive of its speed in the interior of British America.

Mr. Coward gives a bibliography at the close of his volume which is by

¹ Descriptions of Seventeen new Neotropical Birds. By W. E. Clyde Todd. Ann. Carnegie Mus., VIII, No. 2, 1912, p. 198-214.

² The Migration of Birds. By T. A. Coward. Cambridge: at the University Press. New York: G. P. Putnam's Sons. 1912. (The Cambridge Manuals of Science and Literature.) Small 8vo, pp. i-ix + 1-137, with 4 maps. Price, 40 cents.

no means complete. Curiously enough Dr. Watson's important experiments with the Noddy and Sooty Terns on the Tortugas seem to be known to him only through a casual mention by Dr. Allen.— W. S.

'Oologia Neerlandica.'¹— Parts 2 and 3 of this excellent work are at hand and are fully up to the high standard set by Part 1. The eggs of the Thrushes, Warblers, Finches, Pipits, Hawks, and Owls, are figured in these numbers, which comprise in all sixty-five plates of from three to six figures each.

The text as in the previous part considers in detail the structure of the egg shell, often with results of no little interest. Among the Owls for instance, investigations along this line place *Athene* and *Syrnium* together, and also show close affinity between the two species of *Asio* while the Barn Owl stands off by itself. In the text relating to the Cuckoo no less than twenty-seven species of birds are listed in whose nests, in the Netherlands, Cuckoos' eggs have been found. Mr. Van Pelt Lechner is to be congratulated upon producing a work which will exert an influence far beyond the limited area of which it especially treats, and one which cannot help to increase interest in, and place on a higher plane, the study of birds' eggs.— W. S.

Morse's 'A Pocket List of Birds of Eastern Massachusetts.'²— This little work is intended as a handy pocket reminder to the local bird student of 'what, when, and where' to seek, and it seems to admirably meet the requirements of such a publication. Under each species are given its common and technical name, a brief statement of its relative abundance, character of occurrence, and the actual dates of occurrence in eastern Massachusetts, the kind of places usually inhabited by it, and in species of limited distribution, the counties or towns in which it is known to occur. Seasonal charts give a graphic idea of the time of occurrence of all the species, and a short introduction furnishes such explanations as are required. There is also an index to common names and a photogravure frontispiece of Egg Rock and the Nahant Shore.— W. S.

The Ornithological Journals.

Bird Lore. Vol. XIV, No. 2. March-April, 1912.

The Duck Hawk on the Palisades. By W. C. Clarke.

The Barred Owl at Rhinebeck, N. Y. By M. S. Crosby.

A Bluebird Study. By L. Claude.

¹ Oologia Neerlandica | Eggs | of | Birds | breeding in the Netherlands | By | A. A. Van Pelt Lechner, | The Hague | Martinus Nijhoff | 1911.

² A Pocket List | of the | Birds of Eastern Massachusetts | with especial reference to | Essex County | by | Albert P. Morse | Curator of Natural History, Peabody Museum, Salem [etc., etc.]. — Published by the Peabody Academy of Science | Salem, Mass. | 1912. | pp. 1-92 + 6 charts.

The Migration and Plumages of North American Sparrows. (Continued.)
The Hairy and Downy Woodpeckers. Educational Leaflet, No. 55.

By Alice H. Walter.

Bird Lore. Vol. XIV, No. 3. May-June, 1912.

The Golden-winged Warbler at Rhinebeck, N. Y. By M. S. Crosby.

One Little Hummer and I. By W. H. Palmer.

Notes on Cliff Swallows. By K. P. and E. W. Victor.

Making an Acquaintance: The White-eyed Vireo. By A. C. Redfie d.

Ezekiel — By M. J. Selby. — A captive Rose-breasted Grosbeak. I

The Migration and Plumage of North American Sparrows, — Black-headed and Rose-breasted Grosbeaks.

The Ruby-throated Hummingbird. Educational Leaflet, No. 56. By Mabel Osgood Wright.

The Condor. Vol. XIV, No. 2. March-April, 1912.

A Week Afield in Southern Arizona. By F. C. Willard.

Passerella stephensi in Marin County, California. By Joseph Maillard.

Nesting of the Canada Goose at Lake Tahoe. By M. S. Ray.

The Condor. Vol. XIV, No. 3. May-June, 1912.

Some North Central Colorado Bird Notes. By E. R. Warren. — Notes on 105 species observed during a 700-mile wagon trip.

An Afternoon's Field Notes. By J. Grinnell. — Contains observations on intervals between the calls or songs of various species.

The Wilson Bulletin. No. 78. March, 1912.

A Preliminary List of the Summer Birds of Fall River County, southwestern S. Dakota. By S. S. Visher — In a more or less critical region like this where one approaches the line of intergradation between geographic races, the greatest care should be exercised in identification, yet subspecies are here identified positively without any allusion to specimens or characters, some of them, such as *Dryobates pubescens nelsoni*, far out of their known range. Such carelessness reflects upon the accuracy of the entire list.

A Study of the Avifauna of the Lake Erie Islands. By Lynds Jones — Relates especially to migration phenomena.

Moments with Le Conte's Sparrows. By Althea R. Sherman.

Observations of Bird Life in Northern New Jersey during the winter of 1910-1911. By Louis S. Kohler.

Alleged Breeding Occurrences of the LeConte Sparrow in Illinois. By P. B. Peabody.

A Michigan Record for the Gannet. By N. A. Wood.

Status of the European Starling in Essex Co., N. J. By Louis S. Kohler.

The Ibis. IX Series. Vol. VI, No. 22. April, 1912.

On a Collection of Birds made by Mr. Willoughby P. Lowe on the West Coast of Africa and outlying Islands; with Field Notes by the Collector. By David H. Bannerman. — Sixteen species were added to the fauna of Liberia. There is a most interesting account of the protected colony of Gannets (*Sula capensis*), Cormorants and Penguins on Ichabo Island.

Observations on the Striated Field Wren (*Calamanthus fuliginosus*). By H. Stuart Dove.

Notes on some South American Birds. By Claude H. B. Grant. Supplementary to a paper in 'The Ibis' for 1911, contains information on the habits of neotropical *Molothri*.

Notes on the *Ruticilla nigra* of Giglioli. By T. Salvadori — Proves to be *R. tithys* blackened accidentally by soot while confined alive.

On a Journey to the Fiji Islands, with Notes on the present status of their Avifauna, made during a year's stay in the Group, 1910-1911. By P. H. Bahr—together with a Description of a small collection of skins from the same locality. By C. B. Ticehurst.—*Calliptilus solitarius* figured.

Notes on the Ornithology of Corsica, Part IV (concluded). By the Rev. Francis C. R. Jourdain.

Notes on *Laniarius mufumbiri*. By W. R. Ogilvie-Grant (figured).

Remarks on the Syrninx of the Scolopacidae. By W. P. Pycraft.

Bulletin of the British Ornithologists' Club. CLXXVI. February 28, 1912.

Mr. Ogilvie Grant discusses the Crows of Australia and decides that their proper nomenclature is as follows: *Corvus coronoides* Vig. & Horsf., the Raven; *Corvus ceciliae* Mathews, the Crow; and *Corvus bennetti* North, the Jackdaw.

Mr. W. P. Pycraft describes the structure of the Syrninx in the Jack snipe, and explains the presence of an intercalary bar of cartilage. Dr. P. H. Bahr considers that each group of snipe has some special modification for the production of sound, in some species the stiffened spine-like rectrices, in others the emarginated remiges, while the peculiar syrninx in the Jack snipe is for the same purpose.

The following new birds are described: *Diomedea culminata mathewsi* Roths., Campbell Isl., N. Z.; *Cryptospiza borealis* Percival, Mt. Uguess, n. of Guasso Nyero; *Cæreba pacifica* P. R. Lowe, coast of Peru; and *C. chloropyga alleni* P. R. Lowe, Matto Grosso, Brazil.

Bulletin of the British Ornithologists' Club. CLXXVIII. April 26, 1912. Contains a general discussion on 'erythrism' in birds' eggs and some observations on the birds of the Fanning Islands.

British Birds. Vol. V, No. 11. April 1, 1912.

The Dipper at the Nest. By Arthur Brook.—With photographs.

Some Results obtained by ringing Starlings. By N. H. Joy.—1696 birds trapped and ringed in less than two years.

Manx Ornithological Notes. By F. S. Graves and P. G. Ralfe.

Under the head of 'Notes' are numerous records of the recovery of marked birds and of the unusual occurrence of Little Auks during January and February, 1912 (continued in the next number).

British Birds. Vol. V, No. 12. May 1, 1912.

On Incubation. By Eric B. Dunlop.—Discusses the large number of species which begin to incubate when the first egg is laid, 'Ovitegæ' the

author terms them, as opposed to the 'Ovinudæ' which do not sit until the full clutch is laid.

The Avicultural Magazine. Vol. III, No. 5. March, 1912.

Habits of the Wedge-tailed Green Pigeon (*Sphenocercus sphenurus*). By P. T. L. Dodsworth — (continued in next number). Scarcely ever descends to the ground or drinks.

The Avicultural Magazine. Vol. III, No. 6. April, 1912.

The Display of the Satyra Tragopan Pheasant (*Cerionis satyra*). By C. B. Smith.

Diary of Birds seen on the White Nile. By R. Staples-Browne (continued in May number).

Photograph of Peacock Pheasant in display.

How to Breed Birds. By J. L. Bonhote.

The Avicultural Magazine. Vol. III, No. 7. May, 1912.

Hunstein's Bird of Paradise. By E. J. Brook.—Colored plate of *Diphyllodes hunsteini* and account of it in captivity.

Aviary Notes. By W. A. Harding — Rearing of hybrid Lorikeets (*Trichoglossus*). Notes of the Bellbird (*Chasmorhynchus nudicollis*).

Bird Notes. Vol. III, Nos. 1-4. January-April, 1912.

Beside the numerous notes and articles on cage birds and breeding, E. Hopkinson has a serial paper on 'The Birds of Gambia' while under 'Bird Life through the Camera' are illustrated accounts of the Moorhen, Kestrel, and Stone Chat by H. Willford. There are colored figures of *Tanagrella cyanomelæna* and *Calliste vielloti* in No. 1 and *Chloropsis jerdoni* in No. 4.

The Emu. Vol. XI, Part 4. April, 1912.

Bush Birds of New Zealand (concluded). By J. C. McLean.

Field Notes on the White-browed Field Wren (*Calamanthus albiloris*). By L. G. Chandler.

Further Notes from Stirling Ranges, W. Australia. By F. L. Whitlock.

Annotations by A. J. Campbell.—*Eopsaltria hilli* = *Pachycephala melanura*, female. *Pseudogerygone jacksoni* n. sp.

Descriptions of two nests and eggs. By H. L. White.—*Megalurus striatus* and *Pseudogerygone jacksoni*.

Notes on the Native Hen (*Tribonyx mortieri*). By Miss J. A. Fletcher.

Additional Notes on the Helmeted Honey-eater (*Ptilotis cassidix*). By F. E. Wilson.

Shaw's Zoology of New Holland, 1794. By Gregory M. Mathews.

A French Explorer's Australian Bird List. By Ernest Scott.—Translation of a letter from Capt. Baudin of the French Expedition of 1800.

Fac-simile of Membership Certificate of The Gould League of Bird Lovers of New South Wales.

Ardea. Journal of the Netherlands Ornithological Society. Vol. 1, part 1. April, 1912

Contains local notes and papers and a report on bird-banding, also an article by J. L. F. De Meyere. "Do Magpies make 'Sham-nests?'"

Aquila. Tom. XVIII. Budapest, 1911.

Bird Migration in Hungary for spring of 1910. Compiled by Koloman Lambrecht.—An extended record forming the 17th annual report of the Royal Hungarian Central Bureau for Ornithology.

Something about Bird Song. By Michael Matunsh — Contains numerous reproductions in musical notation of the song of *Parus major*.

Stomach and Pellet Investigations of the Native Owls (of Hungary) By Dr. E. Greschik — A valuable economic paper.

Several other papers deal with Economic Ornithology and Bird Banding.

Ornithologische Monatsberichte. Vol. XX, No. 1. January, 1912. Separation of the Genera *Harpyhalietus* and *Urubitornis*. By Dr. K. Kothe.

Two new Thrushes. By Harald Baron Loudon.—*Turdus pilaris sarudnyi*, *T. viscivorus sarudnyi* from Transcaspia.

A New Marsh-tit. By W. Hachlor.—*Poecile baicalensis suschkini* Tarbagatai mountain.

Ornithologische Monatsberichte. Vol. XX, No. 2. February, 1912.

Descriptions of New Birds from the Territory of the Lower Amazon. By Hans Graf von Berlepsch.—*Conopophaga snethlageae*, *Vireolanius leucotis simplex*, *Knipolegus orenocensis zinguensis*, *Platyrhynchus griseiceps amazonicus*, *Hypocnemis naevia ochracea*.

On the Bathing of Birds. By Dr. O. Heinroth.

New Crested Larks. By Paul Kollibay — *Ptilocorys cristata ioniul P. cr. subtaurica*, *P. cr. weigoldi*.

New African Birds. By Reichenow.—*Mesopicus schultzei*, *Barbaterchrysocoma schubotzi*, *Apalis rufogularis kamerunensis*, *Camaroptera supaciliaris kamerunensis*.

The Crested Lark of the Balearic Islands. By E. Hartert. *Galerida theklae polatzeki* subsp. nov.

Ornithologische Monatsberichte. Vol. XX, No. 3. March, 1912.

Two new Palearctic forms. By H. B. London.—*Lynx torquilla sarudnyi* and *Chrysomitris spinus buturlini*.

Three new Abyssinian Birds. By D. J. v. Madarasz — *Poliospiza dimidiata*, *Fringillaria kovacs* and *Columba sodalicia*.

Two new species from Fernando Po. By Reichenow — *Alseonax poensis* and *Ploceus melanolaema*.

Ornithologische Monatsberichte. Vol. XX, No. 4. April, 1912.

On the Nesting Habits of *Poicephalus meyeri matschiei*. By Ludwig Schuster.

Remarks on the Paradise Flycatcher of Ceylon. By N. Sarudny and M. Härms — *Tchitrea paradisi ceylonensis* subsp. nov.

A New African Heron. By A. Reichenow — *Tigribaphys leucoæma*, n. gen. et. n. sp. Ukerewe Island. Victoria Nyanza.

A contribution to the Geographic Distribution of the two Pacific species of Numenius. By J. Henninger — *N. variegatus* and *N. tahitiensis* *Dryobates medius transcaucasicus* nom. nov. for *Dendrocytes medius colchicus*.

Ornithologische Monatsberichte. Vol. XX, No. 5. May, 1912.

Contribution to the Classification of Some African Bird Groups. By O. Graf Zedlitz.—*Serinus angolensis hilgerti*, *Uraeginthus cyanocephalus mülleri*, *Calamonastes simplex erlangeri*, and *C. s. hilgerti* subsp. nov.

Dendrocopos analis longipennis subsp. nov. By Erick Hesse.

Parus cinereus ferghanensis subsp. nov. By S. A. Buturlin.

Ornithologische Monatschrift. Vol. 37, Nos. 1-5.

No. 1 contains several articles illustrated by photographs of birds breeding on the shores and islands of the North Sea and a paper 'How can we make an exact study of the problem of Bird Migration.' By Dr. Hugo Weigold of Heligoland, illustrated by charts.

No. 2, besides the usual local articles etc., contains excellent photographs of the Kinglet and Kingfisher reproduced in colors.

Journal für Ornithologie. Vol. 60, No. 2. April, 1912.

Tenth annual Report of Bird Migration Observations of the German Ornithological Society (1910). By Dr. J. Thienemann.—Comprises over 100 pages of text and several charts.

Ornithology of N. W. Mesopotamia and Interior Syria. By Dr. H. Weigold.

New Species from the Uelle region Middle Africa. By A. Reichenow. *Guttera plumifera schubotzi*, *Francolinus lathamii schubotzi*, *Vinago calva uellensis*, *Ploceus anochlorus*, *Cinnyris chloropygius uellensis*, *Alethe uellensis*, *Alethe polioptera*.

Ornithologisches Jahrbuch. Vol. XXIII, Nos. 1-2. January-April, 1912.

Houbara macqueeni Gray. By J. Aharoni.—An extended account of this Bustard.

Critical Review of "The Birds of the Croatian Fauna." By Dr. M. Hirtz.—Contains many important corrections.

Several other local papers.

Verhandlungen der Ornithologischen Gesellschaft in Bayern. Vol. XI, No. 1. January, 1912.

Dr. Karl Parrot. By L. von Besserer.

Seventh Annual Report of Bird Observation in Bavaria, 1909 and 1910. By Dr. J. Gengler.

Description of a New Dendrocolaptid from Venezuela. By C. E. Hellmayr and Joseph Graf von Seilern — *Automolus klagesi*.

On New and Rare Birds from South Peru. By C. E. Hellmayr — *Automolus walkinsi*, *Thamnophilus marcapatae* spp. nov.

Two New Palearctic Forms. By A. Laubmann.—*Garrulus glandarius corsicanus* and *Accipiter nisus teneriffæ* subsp. nov.

Messenger Ornithologique. 1912, No. 1. [In Russian].

Notes on the Ornithology of Turkestan (continued). By N. A. Sarudny. — *Chroicocephalus ridibundus lavrovi* subsp. nov.

Breeding grounds of *Eurymorhynchus pygmaeus*. By S. A. Buturlin.

Messenger Ornithologique. 1912, No. 2. [In Russian].

Besides several papers on Russian and Transcaucasian birds there are the following:

On the Ornithology of Turkestan. By N. A. Sarudny — *Urinator arcticus suschkini* and *Cerchneis naumanni turkestanicus* subsp. nov.

Parus bokharensis and its races. By N. A. Sarudny and S. I. Bilkewitsch — *P. b. iliensis* and *P. b. dzungaricus* subsp. nov.

A new Creeper. By W. B. Banikowski — *Certhia familiaris buturlini*

Ornithological Articles in Other Journals.

Hilgert, C. *Laniarius funebris degener* subsp. nov. Described from South Somaliland. *L. f. atrocæruleus* subsp. nov. from Abyssinia appears in the same paper. (Novitates Zoologicæ, XVIII, No. 3, pp. 605-606.)

Hartert, E. Notes on Paradisæidæ. *Falcinellus astrapioides* and *Astrapia rothschildi* with two plates. (Novitates Zoologicæ, XVIII, No. 3, p. 604.)

Salvidori, T. Note on *Conurus æruginosus* and allied species. (Novitates Zoologicæ, XIX, pp. 84-85.)

Rothschild, W. and **Hartert, E.** Ornithological Explorations in Algeria. (Novitates Zoologicæ, XVIII, pp. 456-550, with fifteen plates illustrating the character of the country) — Comprises an interesting introduction and annotated list of 230 species, *Colæus monedula cirtensis*, and *Galerida thecklæ hilgerti* subsp. nov.

Mathews, Gregory M. Reference-List to the Birds of Australia. (Novitates Zoologicæ, XVIII, pp. 171-455.) — This is essentially a new edition of the author's 'Handlist of the Birds of Australia' published in 1908 and is made necessary by the fact that the Handlist did not conform in its nomenclature with the International Code. The number of species or subspecies listed is 1151, of which the enormous number of 537 are here described as new! Several new genera also appear.

Van Oort, E. D. On *Æstelata aterrima* (Bonap.). (Notes from the Leyden Mus., XXXIV, No. II, p. 70.)

Schonteden, H. Le Balæniceps roi. (Rev. Zoologique Africaine I., fasc. 3, pp. 347-352, fig. 1, ppl. XIX-XX.)

Maguan, A. Morphologie stomacale en fonction du regime alimentaire chez les Oiseaux. (Ann. Sci. Nat., Zool., XV, pp. 1-42.)

Publications Received. — **Bowles, J. H.** and **Howell, A. B.** The Shore Birds of Santa Barbara. (The Condor, XIV, 1912, pp. 4-11.)

Bryant, H. C. The Relation of Birds to an Insect Outbreak in Northern California during the Spring and Summer of 1911 (The Condor, XIII, 1911, pp. 195-208).

Chapman, Frank M. Handbook of Birds of Eastern North America. Revised Edition. New York and London, D. Appleton and Co., 1912. Library Edition \$3.50. Pocket Edition \$4.00.

Clarke, William Eagle. Studies in Bird Migration. 2 vols. London. Gurney and Jackson, 1912. 18s. net.

Clark, Austin H. The Ontogeny of a Genus. (Amer. Nat., XLV, 1911, pp. 372-374).

Coward, T. A. The Migration of Birds. (Cambridge Manuals of Science and Literature.) Cambridge: Univ. Press. New York: G. P. Putnam's Sons, 1912.

Dearborn, Ned. The English Sparrow as a Pest. Farmers' Bull. 493, U. S. Dept. Agr., Washington, 1912.

Dill, Homer R. and Bryan, Wm. Alanson. Report of an Expedition to Laysan Island in 1911. Bull. 42. Biol. Survey U. S. Dept. Agr. Washington, 1912.

Hartert, E., Jourdain, F. C. R., Ticehurst, N. F. and Witherby, H. F.—A Hand-List of British Birds. London, Witherby & Co., 1912.

Headley, F. W. The Flight of Birds. Witherby & Co., London, 1912. 5s. net.

Horsburgh, Major Boyd. The Game-Birds and Water-Fowl of South Africa, with coloured plates by Sergeant C. G. Davies. Part I. London, Witherby & Co., March, 1912.

Howard, H. Eliot. The British Warblers. A History with Problems of their Lives. Illustrated by Henrik Grönvold. Part 6. London, R. H. Porter, December, 1911. 21s. net.

Kuser, John Dryden. The Birds of Somerset Hills. Published by the Author, 1912.

Lynes, Commander H. Field-Notes on a Collection of Birds from the Mediterranean. With Systematic Notes by H. F. Witherby. (The Ibis 1912, pp. 121-187.)

McAtee, W. L. Bird Enemies of the Codling Moth. (Yearbook U. S. Dept. Agr., 1911, pp. 235-246.)

McAtee, W. L. and Beal, F. E. L. Some Common Game, Aquatic and Rapaceous Birds in Relation to Man. Farmers' Bull. 497. U. S. Dept. Agr., Washington, 1912.

Mathews, Gregory M. The Birds of Australia. Vol. I, Pt. 6, Vol. II, Pt. 1.

Henshaw, H. W. Our Mid-Pacific Bird Reservation. (Yearbook U. S. Dept. Agr. 1911, pp. 153-164.)

Morse, Albert P. Pocket List of Birds of Eastern Massachusetts. Published by the Peabody Acad. of Sci., Salem, Mass., 1912.

Murphy, R. C. The Birds of Prospect Park, Brooklyn. (The Museum News, Brooklyn, N. Y., May, 1912, pp. 113-119.)

Oberholser, H. C. A Revision of the Forms of the Edible-Nest Swiftlet, *Collocalia fuciphaga* (Thunberg). (Proc. U. S. Nat. Mus. 42, pp. 11-20, 1912.)

Shufeldt, R. W. American Ducks and How to Distinguish Them. Pts. II-IV. (Outer's Book. April-June, 1912.)

Todd, W. E. Clyde. Descriptions of Seventeen New Neotropical Birds. (Ann. Carnegie Mus., Pittsburgh, VIII, pp. 198-214, May 20, 1912.)

Lechner, A. A. Van Pelt. *Oologia Neerlandica. Eggs of Birds Breeding in the Netherlands.* The Hague, Martinus Nijhoff. Parts 2 and 3. £1. 10 s. net. each. 1911 and 1912.

Wright, Horace W. *Birds of the Jefferson Region in the White Mountains, New Hampshire.* (Proc. Manchester Inst. Arts and Sci., V., Pt. 1, 1911.)

Abstract Proc. Zool. Soc. London, Nos. 105-106, 108-110.

Animals' Friend, XVIII, Nos. 6 and 8, March and May, 1912.

Ardea I, No. 1, April, 1912.

Austral Avian Record, I, No. 2, April 2, 1912.

Avicultural Magazine (3) III, Nos. 6-7, April-May, 1912.

Bird-Lore, XIV, Nos. 2-3, Mar.-April, May-June, 1912.

British Birds, V, Nos. 11-12, April-May, 1912.

Bulletin British Ornith. Club, No. CLXXVII, March 26, 1912.

Bulletin Charleston Museum VIII, Nos. 4-5, April-May, 1912.

Condor, The, XIV, Nos. 2-3, March-April, May-June, 1912.

Emu, The, XI, Part 4, April, 1912.

Forest and Stream, LXXVIII, Nos. 13-25, 1912.

Glasgow Naturalist, The, I, II, III, and IV, Nos. 1-2. Nov., 1908-Feb., 1912.

Ibis, The, (9) VI, No. 22, April, 1912.

Messenger Ornithologique, No. 2, 1912.

Oologist, The, XXIX, Nos. 4-5, April-May, 1912.

Ornithologisches Jahrbuch, XXIII, Nos. 1-2, Jan.-April, 1912.

Ornithologische Monatsschrift, 37, Nos. 4-5, April-May, 1912.

Ottawa Naturalist, The, XXV, No. 12, XXVI, Nos. 1-2, March-May, 1912.

Philippine Journal of Science, The, VI, No. 6, Dec., 1911.

Philippine Bureau of Science, Tenth Annual Report, 1912.

Proceedings Acad. Nat. Sci. Philadelphia, LXIV, Pt. 1, 1912.

Proceedings and Transactions Nova Scotia Inst. Science, XII, Pt. 3, March 18, 1912.

Science, N. S., XXXV, Nos. 900-912, 1912.

Rod and Gun in Canada, XIII, No. 8, Jan., 1912.

Zoologist, The, (4) XIV, Nos. 183-185, March-May, 1912.

CORRESPONDENCE.

Sclater's Contour Map of Colorado.

EDITOR OF 'THE AUK':

Dear Sir: — In commenting upon Sclater's excellent book on the Birds of Colorado in the April number of 'The Auk,' I neglected to mention his map. It is very unfortunate that he republished this map, which is evidently taken from Rydberg's Flora of Colorado, because it is exceedingly incorrect as to contour lines. In a state like Colorado, presenting differences in altitude of a mile and a half, the altitudes of various localities are of great importance to naturalists. Altitude is an essential element in the study of the distribution of plants and animals in Colorado and of the migrations of birds. In the map in question, to take a few out of many examples, the contour lines give Boulder an altitude of about 2 000 feet too much, Golden 2,500 feet too much, Denver 1,000 feet, Trinidad 1,000 feet, Meeker is placed considerably too low, etc. Fortunately a gazeteer in each of the books mentioned will in part correct the faults of the map for those who notice and use it instead of the map. The altitudes of most of the towns of the state may also of course be obtained from the Dictionary of Altitudes published by the United States Geological Survey, or the Gazetteer of Colorado (Bulletin 291 of the same survey). These publications also give the altitudes of many other points aside from the towns. Nearly all western railway folders also give the altitudes of stations along their routes. The Colorado Geological Survey has almost ready for the printer a new topographic map of the state, based upon data from the most reliable sources, which will place the contour lines in as nearly their correct positions as can be done at present, and in those portions of the state where detailed field work has been done the lines will be very accurate. Consequently no naturalist need have any difficulty in most cases in obtaining altitudes, providing he is warned against using the map in Sclater's book and in the Flora of Colorado.

JUNIUS HENDERSON.

A Correction.

EDITOR OF 'THE AUK': —

Dear Sir: — I find that the Index to the 'Bulletin of the Nuttall Ornithological Club' and 'The Auk', for the period 1876–1900 (New York, 1907), includes on page 72 the titles of all the contributions of the late Captain John Clifford Brown, U. S. V.,¹ under another's name, though on page 235 "Brown, J. C." is given credit for four of them which relate to

¹ See Auk' XVIII, pp. 220–221.

Maine and on page 45 for one which relates to the Atlantic Ocean. Corrections as to authorship should therefore be made in the case of the following titles appearing on page 72 of the Index:

Carpodacus purpureus at Portland, Maine, in winter.

Early appearance of *Empidonax minimus* at Portland, Maine.

Unusual nesting site of *Dendroica virens*.

Winter notes from Portland, Maine.

American Crossbill at sea.

These were published by Captain Brown.

Yours very truly,

N. C. B.

Concealing Coloration.

EDITOR OF 'THE AUK':—

Dear Sir:— The naturalists answer about this or that creature, whose wonderful background matching I show, that he has no use for concealment. Here they are in their own field though venturing far beyond scientific knowledge; but this does not in the slightest degree affect the all the more interesting fact of his astoundingly perfect background painting. And because in all these cases, these creatures (supposed to need no concealment) nevertheless have it from the very situation from which some animals see them. I do not believe that so wonderful an equipment is for nothing, and I doubt the naturalists' assertion that it does not help the wearer.

Most naturalists also deride the idea that so vast a variety of costume as that of the forest fauna could all be subject to one law of concealing coloration.

Concealing coloration is simply that which passes the wearer off for any details of the scene, and of these the forest contains of course a boundless variety. To test at the start the probability of such a general law, turn from the complexities of the forest to the simplicity of other realms, the sea, the sands, the snow — look at the inhabitants of all these more or less monochrome parts of the world, and you will find that everywhere the nearer to one single color note is the scene the nearer to a corresponding single color note is the animal's costume.

Let them tell me why this so widespread resemblance of inhabitants to background should suddenly cease when one comes to the complex scenery of the woods, which offer a hundred models for counterfeiting where the sea, snow or desert offers one.

Therefore, since each different forest costume is a duplicate of some part of the scene, the catchword that if in the same woods any particular costume is a concealer the others are not, boils down to the same absurdity as saying that if one of the things they counterfeit is real, the others aren't — in other words, if the tree trunk is real, the leaves are not.

It is incredible that a conception born of no particle of fact should be so tenacious of life.

Here is an illustration of the truth.

There are three prominent types of flycatching beak. The gigantic mouth and so to speak *no* beak of the Goatsucker, the common sized, stout beak of *Tyrannus*, and the slim, long, bent-needle beak of a Jacamar. By the common logic, each of these birds should be told that it *does not catch insects*, since it is a physical impossibility that if a beak of one particular shape does so, one of a *different* shape can also do so. The fact that different costumes represent different details of forest scenery is no more remarkable than that different species have a different anatomy.

In the animal world, each different mode of getting a living gathers into a community members of widely differing genera and forms, but, in each of these communities every differently shaped species will be found to use his body proportionately differently in attaining the same end, and for one of these to attain, in those same woods, *inconspicuousness* by *passing for a different forest detail* from that counterfeited by his neighbor, is in no way more remarkable than for him to bring to this community his different anatomy, and the main point is that all these counterfeits do succeed.

ABBOTT H. THAYER.

Monadnock, N. H., June 1, 1912.

NOTES AND NEWS.

IN the present issue of 'The Auk' there is presented the sixteenth supplement to the A. O. U. Check-List of N. A. Birds, the first since the appearance of the new (third) edition of the Check-List. It is now nearly thirty years since the A. O. U. Committee on the Classification and Nomenclature of North American Birds was first appointed, and as a new generation of ornithologists has grown up in the meantime, a word as to the objects and province of this committee may not be out of place.

Everyone has an undisputed right to describe as many new species or races as he pleases and so fully has this privilege been exercised that new forms have been split off on finer and finer grades of differentiation as the years go by. Whether or not all these forms shall be included in the Check-List is one of the questions that the A. O. U. has left to its Committee. The Committee endeavors to obtain authentic material from the author of the new form and from elsewhere, and with the author's presentation of the case before it, decides by vote whether or not the alleged differences are sufficiently well marked to warrant recognition by name

The specialist working over a group of birds constantly for weeks at a time, unconsciously magnifies the differences which he finds between birds from areas, which he has reason to think, ought to yield separable geographic races. The Committee usually is able to recognize the differences that he points out, and the rejection of proposed races does not indicate that the author is wrong, but simply that in the opinion of the Committee the differences he has found are too slight and too inconstant to be of any practical utility. The Union believes that for practical purposes the judgment of seven men is better than that of one, and desires the opinion of a committee on all cases of proposed new forms, and the Check-List and its supplements constitute the Committee's opinions and nothing more.

In the same way questions of change of names are also passed upon, although in such cases the Committee is bound by the Code of Nomenclature in reaching its decisions.

In the latest supplement it will be noticed that only cases of proposed new species or subspecies are considered. Cases of nomenclature are left in abeyance for the present.

The object of this action is to maintain the stability of the names in this edition of the Check-List for as long a time as possible. When the List was issued every effort was made to sift all questions of nomenclature to the bottom, and while this was successful in the main, there are certain changes that will still have to be made. These are not numerous, and it seems that nothing is to be gained by hasty action in the matter, so for the present no changes will be made in the List on purely nomenclatural grounds.

This brings us to another matter that is exciting certain zoologists in various parts of the world at the present time, namely the advocacy of a list of *nomina conservanda* which shall be maintained regardless of the existence of earlier names for the same species or genera, because these names which have no status under the law of priority have in past years gained a more or less general acceptance. None of the advocates of this plan seem to have any definite idea of how it should be put in practice — at least we have seen none expressed, and they certainly have very different ideas as to just what they desire. '*Nomina conservanda*' seems to be a sort of convenient battle cry under which all who find some old and familiar name in danger of displacement, may rally. A certain number, at least, of those who are in favor of departing from the strict rule of priority, have apparently not looked into the matter sufficiently to discover that only a small portion of the changes in zoological names are really due to priority. As an illustration of the hasty assertions that are too often indulged in by such writers, we may quote from a letter of Mr. C. S. Brimley in the June number of 'Entomological News,' in answer to a call for an expression of opinion among American entomologists for or against the strict enforcement of the law of priority. He says "I am against the strict application of the rule of priority, because there seems to be no end to the changes arising under it. Take the birds of North America, some

700 species, if I remember rightly. The American Ornithologists' Union has had a committee working on them for over thirty years, and every supplement to the original Check-List has an increasingly large number of changes of names, owing to the application of this law."

Let us see how far Mr. Brimley's exposition of the A. O. U. Check-List as a horrible example is correct. In the first place the Committee as already explained, has only passed judgment on *proposed changes*, and has met for this purpose for a few days about every other year; so that the statement regarding the Committee's thirty years of action is rather misleading.

As to the changes in the Check-List. There were in the original edition. 948 named species and subspecies of which 550 remain unchanged in the last edition, while 374 have had either the generic, specific or subspecific name altered, or have undergone a change in rank from species to subspecies or *vice-versa*, and 24 have been dropped. In some cases one change affects several names, as for instance the substitution of *Hylocichla* for *Turdus* by which the names of ten thrushes are altered, but all these are counted in the above total.

Now of these 374 changes 54 are due to a wrong identification, or to the fact that the name formerly in use proved to be a 'nomen nudum.' As an illustration of the first class; Forster in 1772, described the Great Gray Owl as *Strix nebulosa*. Someone, unfamiliar with this bird, supposed that he referred to the Barred Owl, so *nebulosa* was consequently applied to the latter for over one hundred years, and has only recently been transferred to the species for which Forster intended it. Such changes seem inevitable and have nothing to do with the law of priority. Again, 181 changes are due to the subdivision of genera and species, or to mere changes of rank. *Picus* for the small woodpeckers had become *Dryobates*, not by the law of priority but by the subdivision of the genus *Picus*, the latter name being restricted to an Old World group.

As a matter of fact only 99 cases — 70 actual changes — are due to the law of priority, so that it becomes very evident that the chief cause of instability in nomenclature is not 'antiquarian research,' but the extremely modern manufacture of genera and species by splitting up old material — one of the necessary accompaniments of systematic study. Mr. Brimley is therefore mistaken in charging up all the changes in the Check-List to the law of priority, as he is misleading in his statement as to the province of the Committee and the time of its labors.

Those who advocate 'nomina conservanda' will find that their panacea will not cure all the ills of nomenclature.

If they will only be content to let the International Commission proceed with its admirable work for uniformity in nomenclature and help to enforce the rules of the International Code in every case, we shall soon have stability so far as the law of priority is concerned. 'Nomina conservanda' and any other devices for special legislation only delay the attainment of this end. The amusing thing about the whole matter is that while any

to do away with some time honored name, such as *Picus*, on priority would meet with a storm of opposition, we may by generic subdivision abolish it from the designation of every pecker in the world save one, without protest!

PROF. ALFREDO DUGÈS, elected a Corresponding Member of the American Ornithologists' Union, died at his home in Mexico on January 7, 1910, in the eighty-fourth year of his age. From a biographical sketch by Manuel M. Villada in *La Naturaleza* we learn that he was born on April 10, 1826, in Montpellier, France, son of Dr. Antonio Luis Delsescantz Dugès. He received the degree of doctor of medicine at Paris in 1852 and soon after came to Mexico where the rest of his life was spent.

He was professor of Natural history in the State University of Guanajuato up to the time of his death and a constant contributor to *La Naturaleza*, while he published articles also in *La Naturaliste*, 'The Auk' and other journals. Seventy-two titles are listed in the bibliography accompanying Sen. Villada's sketch, most of which treat of reptiles in which he took especial interest. Several species have been named in his honor, those among birds being *Basileuterus rufifrons dugesi* Ridgw. and *Dendroica dugesi* Coale.

WE note in 'The Ibis' the announcement of the death of Mr. Eugene William Oates on November 16, 1911. Mr. Oates was born on December 31, 1845, and spent much of his life in Burmah in the Public Works Department of the Government of India. He was well known for his writings on Indian Birds including the 'Birds of British Burmah'; the bird volumes of Blanford's 'Fauna of British India'; 'Game Birds of India' etc. During his later residence in England he compiled a catalogue of the collection of birds' eggs in the British Museum and served as secretary of the British Ornithologists' Union 1898-1901, editing a subject index to 'The Ibis' 1859 to 1894.

SINCE our last notice¹ of the American Museum of Natural History's Colombian Expedition, its explorations have been continued with most valuable and interesting results.

From a recent publication of the American Museum of Natural History by Frank M. Chapman, containing a preliminary report on the 5000 birds thus far received from the expedition and describing some forty new Colombian birds, we learn that, in August, 1911, W. B. Richardson returned home and L. E. Miller was joined by Arthur A. Allen of Ithaca. Allen and Miller devoted September, October and part of November to work in the Quindio Region of the Central Andes, reaching the snow-line on Santa Isabel at an altitude of 15,600 feet, and securing many species new to Colombia as well as others new to science.

¹ 'The Auk', July, 1911, p. 391.

After a week on the Cauca River at Rio Frio, near Cartago, they crossed the Western Andes to N6vita on the San Juan river and returned to their base at Cali via Buenaventura early in January. Here both men were attacked by fever acquired in the unhealthful Choc6 region, and Mr. Chapman informs us that a start for the headwaters of the Magdalena was necessarily postponed until February. This region was finally reached in April after a trying journey over the Central Andes from Almaguer. Allen suffered so severely from the fever, contracted in the low coast country, that, in May, he was forced to return to the United States leaving Miller to continue the exploration of the zo6logically unknown upper Magdalena basin. Under date of May 6, 1912, Miller writes of the richness of this new field and reports that one of the chief desiderata of the expedition has been secured in his discovery of a nesting colony of the Cock-of-the-Rock. No less than seven nests of this species were found, some of which contained eggs, two being a full set while others held young in every stage from those newly hatched to others ready to fly. This material will enable the American Museum to construct an unusually attractive as well as unique group of a species concerning whose nesting habits we have hitherto known but little.

MR. MARTINUS NIJHOFF, The Hague, Holland, announces an English translation of Penard's 'Birds of Guyana' (Surinam, Cayenne and Demerara) to be issued in two volumes consisting of about 1160 pages and 700 illustrations. Large 8vo, cloth. The price for the first hundred subscribers will be two guineas net. As soon as this number is reached printing will be commenced and the price raised to £3. 3 net.

ARDEA, Journal of the Netherlands Ornithological Society, is the title of a new Ornithological Journal published at The Hague and dealing with the birds of the Netherlands and their colonies. The first number is dated April, 1912. It is published in Dutch.█

THE Local Committee for the thirtieth stated meeting of the American Ornithologists' Union announces that the second week of November has been selected as the time of the meeting. The public sessions will therefore be held at Cambridge, Mass., on November 12, 13 and 14, 1912.



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CANVAS-BACKS AND SCAUP DUCKS RISING FROM THE WATER.

1900



1. THE FLOCK AT REST.



2. SCARP DUCKS CIRCLING.

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THE FREEZING OF CAYUGA LAKE IN ITS RELATION TO BIRD LIFE.

BY ALVIN R. CAHN.

CAYUGA is the largest of seven, nearly parallel lakes which lie in the central portion of New York State. They all extend in a north and south direction, and either directly or indirectly connect at the northern end with Seneca River. Numerous streams are tributary to Cayuga at the south end; the two principal ones are Fall Creek and the Inlet, both of which proved to be important in their relations to bird life, since they furnished open water throughout the period during which the lake was frozen.

The conditions necessary for the complete surface freezing of Cayuga Lake are intensely cold weather, and absolutely quiet atmospheric conditions for a prolonged period. As Cayuga Lake is forty miles long, with a surface area of 66.8 square miles, and situated as it is in a trough between wind-swept hills, it is very seldom indeed that the above conditions prevail for a sufficient length of time to permit the complete closing of the lake. In the present instance, the freezing was preceded by six weeks of extremely cold weather, the temperature dropping as low as sixteen degrees below zero, and the entire period accompanied by high north and northwest winds. Freezing would have occurred earlier than it did except for the continued strong winds. When these abated, the lake froze over entirely during a single night.

There seems to be a tradition that Cayuga Lake closes every twenty years, some basis for which appears in the dates of complete freezing. They are: 1796, 1816, 1836, 1856, 1875, 1884 and 1904. The first two dates are approximated,¹ but for the year 1836 we find records showing the lake to have been covered by a thin coating of ice for a day or two;² in 1856 the lake was frozen sufficiently to allow teams to cross.³ A similar hard freezing occurred in 1875,⁴ and in 1884 the lake froze over on February 15, and remained in this state until April 4. I am told by several persons in Ithaca that similar conditions obtained for a short time in 1895, but I am assured on very good authority that at no time was it completely closed, there existing an area of several square miles which remained open. In 1904 the surface froze completely about the middle of February,⁵ but remained so for a short time only.

It seems evident that this condition of the lake bears a very important relation to bird life, particularly to those species which depend upon the open water for subsistence. So long as a few square miles or even a smaller area remain open, wherein the birds may feed, the effect of the freezing is lost. For this reason, as far as the birds are concerned, the freezing of 1895 may be eliminated. Again, the duration of the frozen period bears an important relation to the bird life, and it is to be regretted that there are no records of ornithological observations for the extremely long period occurring in 1884.

As previously stated, six weeks of excessive cold preceded the freezing during the winter of 1912. Ice twenty-two to twenty-four inches thick formed in the shallows at both ends of the lake, and as the cold weather continued, the frozen area extended outward little by little. During the afternoon and night of February 10, the wind fell, and the morning of the 11th found Cayuga Lake frozen from end to end. On the 12th I made my first visit to the lake about Ithaca to investigate conditions. The air was alive

¹ Reed, H. D., & Wright, A. H. "The Vertebrate Fauna of the Cayuga Lake Basin, N. Y." *Proc. Amer. Phil. Soc.* Vol. XLVIII No. 193, 1909, p. 372.

² *Ithaca Daily Chronicle*, Dec. 22, 1846, Vol. 1, No. 140.

³ *Ithaca Weekly Journal*, March 12, 1856.

⁴ *Ithaca Daily Journal*, March 3, 1875.

⁵ *Ithaca Daily Journal*, Feb. 16, 1904.



1. CANVAS-BACKS FLYING OVERHEAD.



2. CANVAS-BACKS AT REST.

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with ducks; flock followed flock, in one continuous stream, all flying southward. I am told by Mr. Vann that even more went by on the 11th than on the 12th. By the morning of the 13th the southerly migration had almost ceased, but there were great numbers at rest upon the ice, and from this time on dead birds were found regularly. Large numbers of ducks sought the open, flowing spots of Fall Creek and the Inlet. While there was a little open water here, there was no food, and the majority very soon left. At Ludlowville, about seven miles down the eastern shore, there was a single spot where a spring fed into the lake, forming an open area about thirty yards square, which soon became the rendezvous of all the ducks within a radius of many miles.

Here, a successful attempt was made to feed them. A week after the freezing over of the lake, this pool was black with ducks; so great had their numbers become that free movement was out of the question. It seemed as if there was not room for another individual. Gradually, however, this crowd decreased, the stronger ones leaving for the south continually. From February 23 to March 3, there were not more than three hundred there. Five species were represented in this flock: Bluebill, Canvas-back, Golden-eye, Black Duck and Buffle-head. The Black Ducks were the most wary—the Canvas-backs the least so. It was a rare sensation indeed to be surrounded by flying hundreds of wild ducks, wheeling and flapping within fifty feet of one's head.

In the following paragraphs will be discussed the various species of water birds found from February 10 to March 3, within the area between Ludlowville and Ithaca, including the conditions in which the birds were found, the numbers of dead recorded, and any other points observed which may prove of value.

The author gratefully acknowledges the notes and assistance of Professor H. D. Reed, Dr. A. H. Wright, Mr. L. A. Fuertes and Mr. John Vann, as well as the hearty co-operation of Mr. H. H. Knight, with whom many of the accompanying photographs were taken.

1. *Colymbus holboelli*. HOLBOELL'S GREBE.—The freeing of Cayuga Lake offered a rare opportunity for a study of this most interesting and apparently little known bird. Until the present time, the Holboell's Grebe has been considered only a rare visitant at the southern end of the

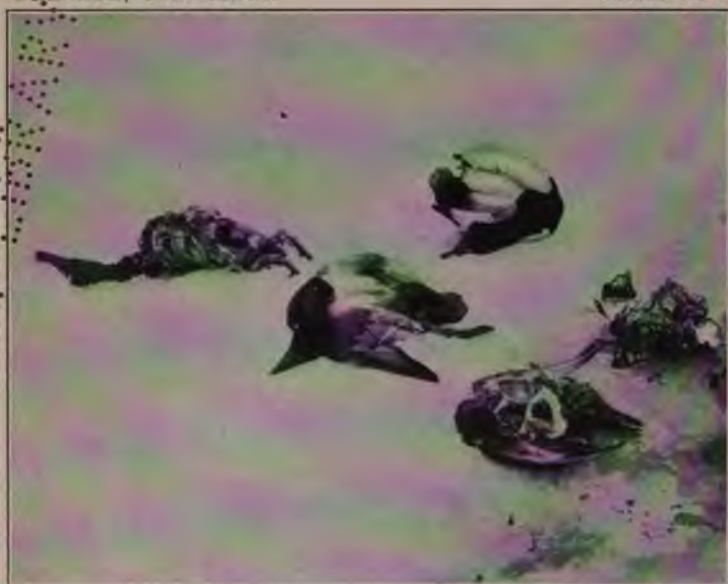
lake,¹ one or two being recorded almost every winter. It has proved, however, to be the predominant grebe during this winter, twenty-eight individuals having been taken. The reason of its unprecedented abundance here is undoubtedly to be found in the six weeks of extremely cold weather, and the consequent closure of waters in other regions. The sudden closing of the lake's surface in one night left these birds in an absolutely helpless condition, since open water is a necessity for taking flight in this group of birds, Holboell's Grebe being no exception to the rule. As a result, eleven beautiful specimens were picked up alive from the ice in perfectly good physical condition. If approached while sitting on the ice, these birds made no attempt to escape. They would strike at the outstretched hand, and would emit calls very loon-like in general quality. Once the bird alights upon the ice, it is unable to take flight, and must await starvation or other tragic end. At best, all it can do is to flap its wings and possibly scrape along over the ice for a few feet. The position of the legs, together with the smooth surface of the ice, rendered these efforts at locomotion entirely futile. The best opportunity of observing this bird occurred in a little piece of open water in Fall Creek, below Ithaca Falls. This hole was about twenty-five feet square, shallow at one end and deep at the other, surrounded on three sides by thin ice, and on the fourth by ice sufficiently strong to afford good footing. The bird had apparently alighted in the pool, and even here there was insufficient open water for taking flight again, and it was therefore possible to study the actions of this bird at very close range. When approached, the bird dove, and remained under water nearly a minute. As soon as it came up, it would dive again on the instant so long as the observer remained near. The water was clear, and the bird could be seen plainly, shooting and zigzagging about, midway between the surface and the bottom. While swimming under water, the neck is extended to its utmost, and both legs and wings are used. With neck outstretched, the bird offers the least possible resistance to the water, there being a smooth and gradual transition from the tip of the slender bill to the middle of the back, the widest part of the body. The speed which is developed under water is marvelous, at times it being almost impossible to follow its movements, which were so rapid that the bird appeared more like a large, gray fish darting about. When coming to the surface, the bill and head appeared slowly, when a glimpse of the observer caused it to dive again. In diving, even though the body was under water, the bill went down first, so that it really dove instead of sinking quietly. After having been under water almost continually for over fifteen minutes, the bird was tired out, and finally came to the surface on the opposite side of the pond from the observer. Here, it drifted nervously about, giving its peculiar squawking note every few seconds. After being watched for some time, it was driven into the

¹ Reed & Wright. *The Vertebrate Fauna of the Cayuga Lake Basin*, N. Y., p. 409.



CANVAS-BACKS RISING.

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1. DEAD SCAUP DUCKS AND CANVAS-BACKS.



2. HOLBELL'S GREBE STRANDED.

shallower water, where it suddenly dove and remained down over a minute. It reappeared finally over two hundred feet away, crawling upon the thin ice through a hole which it had made with its head and bill. The bird was taken from the ice without a struggle or attempt to escape. The other ten living specimens were picked up from the ice on the lake proper, far from any open water.

The stomach contents of the specimens that were found dead were examined and proved interesting, as in each case the sole material found proved to be a ball of feathers.¹ Both the feathers and the inner wall of the gizzard were stained a deep and brilliant emerald green, so that when the contents were removed they appeared to be a mass of dried *Algae*. Several of the feathers were dried, after having been thoroughly cleansed, and were identified as coming from the belly of the Grebe itself. There is room for a great deal of conjecture as to the significance of these feathers in the gizzard. All the birds examined were fat, and had died probably as a result of severe exposure, rather than of starvation. Mr. L. A. Fuertes tells me that the gizzards of the various species of grebes found in this country, which he has examined, have invariably contained a few, and in some specimens, quite a ball of feathers. The green coloring matter proved to be bile. The presence of this bile in the gizzard is another interesting point, a condition due possibly to abstinence from food, as it was present in the case of every bird examined, and present in such abundance as to be very noticeable. There are records, then, of eleven living birds that were captured. Besides these, in the area between Ludlowville and the south end of the lake, seventeen specimens were found dead upon the ice, making a total of twenty-eight birds for eight square miles, and undoubtedly there were some of which nothing is known. The Holboell's Grebe, because of its highly specialized form, probably suffered the most of all the birds upon the lake, and few, if any, escaped.

The vitality of these birds is truly remarkable. As the lake froze on the 10th, the birds had their last possible chance to feed on that date. A male, the only one which showed signs of the red neck, which was taken on the 12th, died on the 28th without having eaten during its captivity. In marked contrast to the other specimens, this bird showed no trace of fat, and instead of weighing 2.5 lbs., which was the average of those that died of exposure, it weighed a scant 1.25 lbs. The average measurements of four birds were: length, 20 in.; extent, 30.8 in.; wing, 7.5 in.; bill along gape, 2.8 in.; tarsus, 2.5 in. Average weight, 2.5 lbs.

2. *Colymbus auritus*. HORNED GREBE.—None of these birds were seen alive, but there are records of three found dead upon the ice. All three specimens had been greatly damaged by crows and gulls.

3. *Podilymbus podiceps*. PIED-BILLED GREBE.—A single dead specimen was found frozen in the ice near the east shore, on the third day after the freezing.

¹ Elfrig, C. W. G. Notes on Some Northern Birds. Auk, XXIII, July, 1906, pp. 314-315.

4. *Larus argentatus*. HERRING GULL.—There was one flock of forty-one Herring Gulls which spent six days within this limited area. Contrary to their usual habits, these birds remained constantly on the ice, and took to the air reluctantly when approached closely. One interesting point was noted which showed the gulls to be hard pressed for food; there were great numbers of "Saw-bellies" (*Pomolobus pseudoharengus*) frozen in the ice at a depth of from three to eight inches. Above those that were nearest the surface, the ice was found to be pecked, showing where the gulls had attempted to reach the fish. One bird was actually seen while thus occupied. No deaths are recorded among the gulls, due, no doubt, to the abundance of dead ducks upon the ice.

5. *Mergus americanus*. MERGANSER.—A number of females were encountered in the Inlet, and two pair were constantly seen in Fall Creek. They appeared not to suffer at all for lack of food, and I often watched them dive under the ice, and remain under for a period ranging from one to two minutes. No dead were found.

6. *Anas rubripes*. BLACK DUCK.—During the first days of the migration, quite a number of these birds were seen, but they were exceedingly wild, and approach was impossible. A flock of approximately one hundred inhabited the water hole at Ludlowville, but the moment they were startled, they rose and flew over the ice, when they lit, and where they remained for the most part until twilight. At dusk they returned to the hole. The Black Ducks did not suffer at all for want of food, as more than once they were found in a field of Alfalfa, two miles from the lake. No deaths are reported.

7. *Marila americana*. REDHEAD.—Numerous flocks were encountered daily, but they were smaller in size than the flocks of the other species, and more wary. Only one small flock of seven allowed me to approach within forty feet of them before they took to wing, after which they rose to a considerable height, and were soon lost in the distance. At another time one of these birds was watched while standing within thirty feet of it, as it swam around in the Inlet in company with a Bluebill and a Golden-eye. This particular bird was a female, and of the three, was by far the most lively. It was she that led them up stream a few yards, and when they finally rose, she took the lead. The Redheads probably suffered very little, though why any particular species should suffer more or less than another, would be difficult to say. Personally, I did not find a single dead Redhead, but there are reports of two having been found.

8. *Marila valisineria*. CANVAS-BACK.—The Canvas-back was second to the Bluebill in abundance. When found they were in small flocks of from three to thirty, but over one hundred inhabited the Ludlowville pool. The numerous flocks were small in size. Not a day passed but that upward of fifty Canvas-backs were seen in flocks averaging ten or fifteen. These ducks suffered, to all appearances, as much as any species on the lake. A flock of twenty-two was approached to within thirty feet one afternoon before they gave any heed, but finally they rose heavily and flew low over

the ice a distance of sixty yards, where they lit, and immediately assumed a resting posture. Two of these ducks were captured alive, both being taken almost as easily as one would take an apple from the ground. The first made one feeble flight when approached, but that was all. He was followed and picked up off the ice without a struggle. The second was taken from the ice without having made any attempt to fly. The condition of both of these birds was pitiful, to say the least. Hardly able to stand erect, and too feeble to mind what was going on around them, they sat on the ice in a more or less dazed condition. The feathers were unpreened, and those of the breast and belly were yellow and matted with grease. Both of these birds were found on the ice of Fall Creek. There are records of twenty-two Canvas-backs that were found dead within this area. Allowing for those that were missed, it is highly probable that these eight miles held about twenty-eight dead of this species, the per cent of mortality being greater than in any other species. By the small pool of open water at Ludlowville, three dead Canvas-backs, together with two dead Bluebills, were found, as shown in the photograph. (Plate XX, Fig. 1). The stomachs examined contained nothing but pebbles, averaging 14.5 grams in weight. These ducks were woefully thin, being, in very truth, nothing but "skin and bones."

9. **Marila marila.** SCAUP DUCK, BLUEBILL.—The most abundant duck seen on the lake during this period was the Bluebill. As a general rule, these birds were found in flocks of various sizes, ranging from a few individuals to four hundred, but single birds were found in the open water of the various streams tributary to the lake. The largest flock seen was just off Portland Point. This flock was discovered at rest upon the ice, and so close together were they, and so numerous, that the birds gave the appearance of a solid black line, and it was not until one had approached to within one hundred yards of them that one could be sure that it was indeed a flock of ducks. The birds were quite indifferent to being approached, and it was not until one was within two hundred feet of them that they showed any signs of uneasiness. When within one hundred feet, they rose slowly and flew some little distance down the lake, where they settled once more into their compact formation. It was not until they rose that one realized that there were easily over four hundred ducks in the flock. It was all but impossible for these birds to rise clear of the ice. The indifference shown toward unguarded approach, the reluctance with which they rose, the short distance which they flew, in fact, their every action bespoke exhaustion and weakness. In a small piece of open, rapidly flowing water in Fall Creek, a female of this species was caught by hand, without difficulty. The bird, too exhausted even to try to fly, could make no headway against the current, and was therefore easily captured. It was too weak to eat, and died within twenty-four hours. Two peculiar incidents with regard to Bluebills have been brought to my notice. One specimen was found while still alive, in which over half the webbing of both feet had been frozen and dropped off. Another was found frozen in a

cake of ice, with nothing but the head and about half the neck protruding from the mass. The duck, still alive, was chopped out, when it was found that the ice had in some way frozen over the duck, leaving water next to the body. This was undoubtedly kept from freezing by the action of the legs and the body heat. The bird was uninjured, and after being fed, seemed little the worse for its experience. In all, nineteen dead Bluebills were found upon the ice of the lake, within six miles of Ithaca, and reports coming from various points along the lake, seem to indicate a rather uniform mortality throughout the entire area. The specimens examined were extremely thin. There was no trace of fat on the bodies, and the breast bones were barely covered by flesh. The stomachs contained nothing whatsoever, while in the gizzards were found small quantities of gravel averaging 13.45 grams in weight.

10. *Clangula clangula americana*. GOLDEN-EYE.—Golden-eyes were encountered daily, although they were less numerous than any of the preceding species of ducks. When seen they were usually in flocks of from twenty to forty, but only a few flocks were seen each day. Usually it was impossible to approach within fifty feet of these birds, although in one instance a flock of a dozen individuals was watched from a considerably shorter distance than this. A beautiful male specimen was picked up in the same manner as the Canvas-backs were captured, and with as little resistance. To all external appearances he was perfect, yet his body was a sad contrast to his brilliant plumage. There are records of five dead Golden-eyes found within the six miles studied. As with the other ducks, the gizzards contained only pebbles, but in smaller quantities, averaging 8.5 grains in weight.

11. *Charitonetta albeola*. BUFFLE-HEAD.—A single male specimen of this species remained constantly in the open water at Ludlowville, and even with stones could not be driven out. It seemed to thrive well on the corn it found scattered there, and was absolutely fearless of human presence. This was the only specimen seen.

THE NIAGARA SWAN TRAP.

BY J. H. FLEMING.

SINCE the great Swan disaster of March, 1908,¹ Whistling Swans (*Olor columbianus*) continue to settle in the upper Niagara River in spring, and floating with the current, a whole flock is sometimes caught in the rapids and swept over the Falls; once in the trap there seems slight chance of escape, though some birds survive the trip over and of these a few, by flying up the river, are able to surmount the Falls and escape. The natural route of escape down the river is barred, as the birds object to flying over the ice or under the Upper Suspension Bridge, and they usually fail to get high enough in the air to clear the Falls.

The spring of 1909 was notable at Niagara for the amount of ice that filled the gorge below the Falls leaving very little open water. I am indebted to Mr. J. S. Wallace for the following account of the losses of that spring. "On Sunday, March 28th, eleven swans were taken on the ice bridge below the Falls, Mr. Leblond getting seven of these, one of them alive and in such good condition that it is now being fed and cared for, and is becoming quite tame and appears to be practically uninjured; another of the eleven mentioned above is also alive and to all appearances uninjured.

"In addition to those taken Leblond saw five others rise from the ice bridge and fly off up the river apparently uninjured, although he does not know that these five were carried over the Falls. The day on which the birds were taken was neither foggy nor wet; so that these accidents to the birds apparently happen at any time.

"About 150 to 200 birds were seen on the river above the Falls on the 28th, and another lot of 25 or 30 were seen flying up the river one day near the end of last week (about March 30).

"The ice bridge extends from the Upper Suspension Bridge almost to the foot of the Falls, and gives the hunters very little chance to secure ducks or other game which may come over at present."

I was at Niagara Falls, Ontario, on April 15th, and saw the two living swans; one was an adult with a lemon yellow spot on the beak, and the other was not fully adult, the beak having an almost imperceptible flesh-colored spot and there was a good deal of gray in its plumage. The only note the birds uttered was a low call. I saw Mr. H. Williams and Mr. Leblond but got no further information than that in Mr. Wallace's letter. There is no record of any swans being killed in 1910, but on March 22, Mr. James Savage, of Buffalo, N. Y., saw a flock estimated at 28 in the upper river opposite Chippewa, Ont., and I quote from his letter. "You may be interested to know that there was another flock of swans on the Niagara River last March which did not go over the Falls. Mr. Broderick, the game inspector at Niagara Falls, N. Y., phoned me that there were twenty-eight of them near Navy Island and that he had approached within 100 yards of them before they took flight. I joined him in the afternoon and we had an interesting experience trying to photograph them about a mile above Goat Island. They finally mounted into the air and filed away towards Lake Ontario. It is not improbable that we saved their lives by driving them away from the place where so many of their kind have come to an untimely end."

In 1911 some swans came over the Falls, 22 were taken on March 23, most of them by Mr. Leblond. Some of these birds were seen by Mr. Wallace, but I have no note of the conditions of the weather or ice at the time. Mr. Ottomar Reinecke of Buffalo records a large flock seen on April 11, presumably in the upper river.

The 1912 toll is the heaviest yet recorded. Mr. Savage writes of the March losses as follows: "My notes show that four swans were picked up on the morning of March 18, and seven others were secured by Leblond on the morning of March 27. He tells me that on this later day, three others were obtained by other parties."

On April 6 Mr. Leblond telephoned me that a great number of swans had come over the Falls that morning, and that he had taken 70 out of the river. I went to Niagara Falls next morning and saw Mr. Leblond at the 'Maid of the Mist' landing on the Canadian side. Two men were standing on the edge of the break-

water with long poles, waiting for birds to float in, the river was open, and only a few cakes of ice coming over the Falls; there was a large mound of ice rising from the rocks below Goat Island. The outlet of the power company on the American side discharges just below the first bridge and, sending a great volume of water across the river, creates an eddy at the landing so that any bird coming down the river with the current is checked below the bridge, sent across the river, and up to the 'Maid of the Mist' landing within reach of the watchers on the breakwater. Mr. Leblond tells me that he first heard swans calling at daybreak on the 6th and they very soon began to float in. He did not say how many of these were alive. There was a slight fog on the river at daybreak. During the day he took seventy out of the river and thinks that fifty or sixty more were taken by others, probably more than 125 altogether; besides these there were four more taken today, and I saw two in the eddy and was told there were more on the shore further down. Besides these there were ten swans alive in the river below the Falls. The birds taken yesterday were at the Hotel Lafayette where Mr. H. Williams showed me sixty of Mr. Leblond's birds. He considers the total catch nearer 200 than 125. All the young birds, except one, had been picked out for eating, so the proportion of young to adults was probably one in seven. Everyone agrees that this flight was greater than the one in 1908, and that many more were taken this time in spite of there being no ice bridge; the birds I examined were less battered up than in 1908 and could not have been long in the water, as they were dry, that is the feathers were not water logged. The birds exhibited a very interesting series of eye spots, one very small adult having a solid lemon yellow spot extending forward from the eye for nearly an inch and a quarter; the color of the spots ran from lemon yellow to flesh yellow. In 1908 the spots ran from yellow to red owing, no doubt, to the ice crushing the birds had received, and the subsequent freezing.

The ten birds remaining alive on the river below the Falls were divided into two flocks, one of which was on the American side, the other on the Canadian; these I watched both from the river level and from the bank above. They were continually floating down the river with the current, and, taking wing, would fly up

towards the Horseshoe Falls, never allowing themselves to float past the 'Maid of the Mist' landing on the American side; they seemed to be afraid to pass under the Upper Suspension Bridge, though their road to safety lay down the river. Herring Gulls were continually passing underneath the bridge but it was too much for the swans to face. The swans rise easily from the water quite like the Herring Gulls, and the easy flapping of the wings on rising and folding of the wings on settling were much the same. Only one swan rose to any height above the water, possibly half way up to the brink of the Falls. The rest kept close to the level of the water, always rising against the current and flying towards the Canadian Falls, but were either unable through weakness or too frightened to rise above and escape into the upper river. One bird was using a cake of ice as a resting place, but he too, was unable to face the prospect of going under the bridge. I have no doubt that all these birds eventually grew too weak to resist the current and were drowned. The Swans arrive in the Niagara with very little food reserve and are unable to get food in the river, and weakened by their battle with the current fall easily at night into the trap set by the rapids above the Falls, as do many other species of water birds. I am told a good many Canvas-backs came over the Falls this spring, I saw one on April 7 besides several Golden-eyes that had met the same fate. Mr. Savage in a recent letter says, "It seems a pity that so many of these noble birds are destroyed every spring, but I see no way to prevent it, if they arrive during the night. If they should be seen on the waters above the Falls, arrangement might be made to drive them away."

METHODS OF ESTIMATING THE CONTENTS OF BIRD
STOMACHS.

BY W. L. MCATEE.

IN his report on "The Food of Birds in India," C. W. Mason expresses decided opinions on the merits of the numerical and the percentage-by-bulk methods of estimating the contents of bird stomachs. Regarding his own work, Mason says: "I have made no statements in a general way as to the relative bulks of the food taken. We see it stated repeatedly that relative bulks of food taken by birds are very important in any conclusion that we may wish to draw from economic entomology. [ornithology?]. . . . Our only method for obtaining this end practically consists of a complete study of the food of the birds, from specimens obtained throughout the year under all climatic, physical and seasonal conditions and even at different times during the day (this latter point is certainly one of importance in some birds and possibly therefore in most) . . . Comparative bulks of foods, if expressed merely as percentages, are of absolutely no value whatever, and cannot give any idea as to the true economic ratio of the food of the bird in question. What we want to know is the exact number of grains of corn, the number of insects, etc., taken, and we must not draw our conclusions from a small number of records nor from a mass of records that have been accumulated at one season of the year only. We must take a fair average." (pp. 18-19.)

As these dicta regarding the percentage valuation of the elements of bird food reflect upon the methods in continuous use by the Biological Survey, U. S. Department of Agriculture, since 1895, a defense of those methods is in order. Arguments similar to those of Mason have been made before, but always it appears by those having a relatively small amount of experience in the actual examination of the contents of birds' stomachs. In fact Mason's arguments are not so strongly opposed to estimation of percentages by bulk, as some of his sentences by themselves seem to imply. For instance he admits that the bulk method would be satisfactory if a large number of stomachs, representing all localities and seasons,

be examined. Later he states that conclusions must not be drawn from a small number of records, we must take a fair average. These things are exactly what every economic investigation, worthy of the name, strives to do, and what has been done with great success in the case of numerous species of birds in the United States. The final percentages of food obtained for some species are not changed by 1 per cent, by the addition of 100 stomachs taken in a restricted area in a single season.

The numerical system (which Mason prefers) of denoting the contents of bird stomachs in contrast to the percentage-by-volume system, has assumed a number of different forms. The modifications we are acquainted with are as follows:

1. Gives total numbers of various groups of insects, seeds, etc., taken by the whole collection of birds examined.
2. States the total number of birds, taking certain items of food, or in other words, the number of times a certain food is taken.
3. States the number of birds eating certain articles of food and the number of specimens taken.
4. The proportion of the number of times a certain food is taken to the total number of times all foods are taken, is considered the percentage of that food in the diet.

5. Estimates the proportions of food items according to their numerical representation among the total of all specimens eaten.

No. 1 is used by Mason (l. c.), No. 2 by Fisher.¹ No. 3 by King² and Newstead,³ No. 4 by Gilmour,⁴ and No. 5, for the estimation of animal food only, by Wilcox.⁵ The last named estimates the percentages of vegetable food by bulk.

Thus 6 investigators who have tried to present the results of stomach examinations by a numerical system, have adopted at least 5 very distinct methods. This indicates that no very satisfactory numerical system has thus far been proposed, a fact which has not however prevented 3 of these men, viz: Mason, King, and Wilcox, from severely criticising the percentage-by-volume method.

¹ [Fisher, A. K.] Bul. 1, Biol. Survey, 1889, pp. 133-143, and Bul. 3, Biol. Survey, 1893.

² King, F. H. Trans. Wis. State Agr. Soc., Vol. XXIV. 1886.

³ Newstead, R. Suppl. Journ. Bd. Agr. [London], XV, No. 9, Dec., 1908.

⁴ Gilmour, John. Trans. Highland and Agr. Soc. Scotland, 1896, pp. 1-93.

⁵ Wilcox, E. V. Bul. 43, Ohio Agr. Exp. Sta., Sept., 1892, pp. 115-131.

In striking contrast to the diversity of opinion about a numerical system is the consistent application of the volumetric method, by at least 9 American food analysts. Dr. G. Röhrig of Germany prefers the related but more technical and difficult method of ascertaining proportions by weight.

Some of Wilcox's objections to the percentage-by-bulk system are stated in the following quotation.¹

"How to estimate the relative proportions of the various food matters found in the stomachs examined is a very important but rather difficult question. Upon a slight consideration it becomes evident that we cannot base our proportions upon the relative bulk of different materials. To illustrate, suppose we place on one side of the equation a blackberry and on the other enough chinch bugs to equal the bulk of the berry. It would obviously be very absurd to assume that the one counterbalances the other. Mr. King . . . has considered this difficulty in the following words:

"If we compare the corn plant-louse, the gall stage of the grape phylloxera, the plum curculio, the small parasitic military microgaster, which lay its eggs in several kinds of cutworms, the potato beetle and the chinch bug with the large coral-winged grasshopper bulk for bulk, the ratios will appear about as follows:

1	Coral-winged grasshopper	=	12,000 military microgasters.
1	"	"	= 3,000 phylloxera.
1	"	"	= 1,500 corn plant-lice.
1	"	"	= 750 chinch bugs.
1	"	"	= 60 plum curculios.
1	"	"	= 7 potato beetles.
1	"	"	= 1,000 young potato beetles.

"By a system of gauging bulk for bulk it is evident from the table that one coral-winged grasshopper eaten by a bird would give it a credit which would offset completely the destruction of 12,000 military microgasters, a proposition sufficiently absurd."

We may remark that Wilcox's own system of estimating the proportions of animal food according to the number of individuals, violates every intent of this precept, as it also gives all individuals equal weight.

¹ Wilcox, E. V. Bul. 43, Ohio Agric. Exp. Sta., Sept., 1892, pp. 118-119.

F. H. King, who is thus quoted by Wilcox, further asks:¹

"How shall a bird's food account be expressed numerically in terms of debit and credit?" This is at once the most difficult and the most important of all the questions requiring solution in order to express the *specific* economic relations of any bird.

"Nothing can be more certain than that, after the food of a bird has been classified under the heads "Elements Beneficial" and "Elements Detrimental" to man, neither the relative volumes nor the relative weights of these two classes of material can express the true economical relations of the bird. (p. 398.)

"A peck of plums and a peck of curculios, a peck of wheat and a peck of chinch-bugs, or a peck of corn and a peck of cutworms, are manifestly not to be considered as equivalent values on opposite sides of any account." (p. 399.)

And Mason says as above noted "Comparative bulks of food, if expressed merely as percentages, are of absolutely no value whatever, and cannot give any idea as to the true economic ratio of the food of the bird in question."

First it should be stated that these gentlemen have no occasion to be so emphatic; their criticisms are wide of the mark for no one claims that percentages do express economic values. They are simply convenient handles to facts and they must be interpreted.

This point is well brought out by the arguments Wilcox advanced in proposing his hybrid system. He says:

"Having seen from the start that the ratios of the different food materials could not justly be estimated according to bulk, and having seen also that a system based upon the number of insects, plant fruits, etc., found in the stomachs examined would be almost equally likely to introduce error, and that it would be a system particularly difficult to carry out in consequence of the fragmentary condition of the food, I decided to combine these two systems of computing the proportions in a way which seemed to me to represent justly all the elements of food. It would be approximately true to say that I have estimated the proportion of animal food according to the number of the individuals, and vegetable food according to bulk. But all fruits which have a definite number of

¹ Trans. Wis. State Agricultural Society, Vol. XXIV, 1886.

seeds have been estimated upon a numerical basis. It is evident that this would have been very difficult or even impossible in the case of blackberries or raspberries in which the number of seeds is so variable.

"It may be objected that the computation of the vegetable food on one basis and of the animal food upon another basis is a fruitful source of error. But I have exercised all care and diligence to avoid every possibility of error, and, in fact, an estimation of the relative proportions of the several kinds of food would not make the vegetal part appear larger than it really is, since a raspberry or blackberry is no greater in bulk than an earthworm or May beetle. It may as well be admitted that, in the present state of knowledge, only an approximation to the truth can be attained in a statement of the relative proportion of the various food materials in a bird diet.

"But even after we have tabulated the numerous articles of food in their differing proportions in a more or less satisfactory manner, the task is by no means completed. In order that we may decide whether the robin is on the whole a benefit or an injury to farmers and gardeners, we must first determine the economic relations of the various species of plants and animals upon which the robin feeds."

It is very evident that interpretation of economic values is the most important point in presenting the results of stomach examination. Whether such results are expressed by the numerical or by the percentage system, the figures in themselves are powerless to convey an impression of economic values. Hence the assertions of Mason, King and others are no more a criticism of the percentage-by-bulk system than they are of the numerical system. For instance King's dictum that "a peck of corn and a peck of cut-worms are manifestly not to be considered as equivalent values on opposite sides of any account," applies just as well to his own numerical accounts. Does it mean anything definite to say that 10 individuals of a certain species of bird have consumed 20 beneficial insects and 35 injurious ones? Do these figures tell us whether the insects in question are large or small? Whether they are

greatly or only moderately beneficial or injurious? do the figures give us any idea as to whether this account about balances? or whether one side greatly overbalances the other?

On the contrary it is evident that they stand just as much in need of interpretation, as do percentages. Hence the question between the two systems is not purely one of expression of economic values, as some supporters of the numerical system would have us believe, but one of the means best adapted to expressing the relations between the various food elements. To the writer's mind the percentage-by-bulk system has all the better of the argument, but let us not so decide without giving the various numerical systems a hearing.

Mason says, "What we want to know is the exact number of grains of corn, the number of insects, etc." To illustrate we may cite one of Mason's summaries: "Of 142 insects taken by 12 birds, 7 are beneficial, 50 injurious and 85 neutral." (p. 118.) Are we to understand that this bird does good and harm in the proportions of 50 to 7? Not unless the insects mentioned are of equal size or at least of equal capacity for good or harm.¹ Suppose the useful species are large forms which do a great deal of good, and the injurious ones small ones of no consequence. Or if you please, make just the reverse supposition. In neither case do the figures above supply the information necessary to reach a final conclusion. The objection that these authors make to our percentages, apply equally well to their figures — they do not give any idea as to the true economic ratios. Like the percentages they must be interpreted.

The principal variation of the numerical system aside from that of Wilcox, which has previously been discussed, is that used by John Gilmour in his paper² on the Wood Pigeon, Rook and Starling. In a review of this paper Professor Beal states:³ "Mr. Gilmour reckons his percentages from the number of times that the bird has taken the food, and from this concludes that grain and husks constitute 58 per cent of the Rook's food. Insects and grubs

¹ Insects whose economic status depends upon their food habits, and this includes the majority, are very properly reckoned by bulk, for as a rule the larger will do more harm or good than the smaller ones.

² Trans. Highland and Agr. Soc. Scotland, 1896, 1-93.

³ Auk XIV. No. 1, Jan., 1897, p. 10.

reckoned in the same way, amount to 23 per cent. It can hardly be claimed that this is the most accurate method of calculating the relative amounts of food found in a bird's stomach. Birds are fond of eating a great many different things, the aggregate quantity of which may be small, just as human beings eat a little butter and sugar at nearly every meal, but never make a whole dinner of either. To illustrate, in an examination of 2258 stomachs of the Crow Blackbird, corn amounted to 35 per cent of the food by bulk, but when reckoned by the number of times taken it aggregated 52 per cent."

Other illustrations from Professor Beal's work show still greater diversity between percentages obtained by these two methods. For instance spiders were found in 26 per cent of 389 stomachs of *Hylocichla ustulata*, but composed only 1.82 per cent of the stomach contents by bulk. The same data for *Hylocichla guttata* is: spiders were found in 49 per cent of 514 stomachs, but made up only 7.35 per cent of the total contents. Ants, much smaller creatures on the average than spiders, while found in fewer stomachs (249 as contrasted with 254) of the Hermit Thrush, compose a considerably larger volume of the food, namely 12.54 per cent. This fact is just contrary to the normal expectation, and would never be guessed from figures showing merely the frequency of occurrence. The misleading nature of such figures is further shown by the fact that wild fruits found in 243 stomachs somewhat fewer than held ants, compose 26.86 per cent or more than twice as large a proportion of the total bulk of the food. Furthermore caterpillars, occurring in 268 or 52 per cent of the stomachs, and hymenoptera (other than ants), found in 136 or 26 per cent, form nearly equal percentages (within a fraction of one per cent) of the total subsistence.

Beyond showing the futility of Gilmour's particular variety of the numerical system, these instances prove, that frequency notations, no matter whether they refer to systematic or to economic groups, do not indicate the importance of these groups in the diet of the species concerned. Hence they do not suffice for the needs of economic investigations.

Let us see what other objections can rightfully be lodged against the numerical system. In the first place the adherent to this

system deprives himself of the possibility of referring accurately to the contents of a very considerable proportion of the stomachs of birds in general, and probably of a majority of those containing vegetable food. In most cases it is impossible to accurately count the number of individuals of much comminuted animal matter, and practically every stomach containing animal food has a portion of it in this condition. Who can reckon the number of earthworms when only the spicules are left, or caterpillars by the spines, or fishes or moths by their scales? Evidently figures cannot be applied to ground up oats, wheat, corn, and their young shoots, nor to fruit pulp, nor to berries containing an indefinite number of seeds. Who can tell from an inspection of the contents of the stomach how many apples, peaches, or grapes a bird has bitten into, or how many strawberries, blackberries or figs it has sampled? Hence a very important feature of economic work, in fact the most important from the standpoint of the farmer, cannot be expressed by the numerical system. This fact alone proves the inadequacy of the method. It is noticeable that Mason was unable to carry out his intention as to counting all items, particularly in the case of *Ficus* fruits, and of various buds and shoots. Neither can he refrain from using expressions denoting bulk proportions of food.¹

King for the best of reasons takes no cognizance of vegetable food in his tables, but has the audacity to condemn the percentage system almost in the same breath. As an example of the way King's methods work out, we may quote his account of the food of the Blue Jay (*l. c.* p. 540). "Of 31 specimens examined, 19 had eaten acorns; 15, 30 beetles, among them several species of *Harpalidæ* and a *Cetonia*; 2, 2 caterpillars; 2, 2 grubs; one, some other larvæ; 2, grasshoppers; 5, corn; one, wheat; and one berries. No stomach was found to contain only insects; and of those which contained beetles, their remains never composed more than one-fifth of the entire contents, and usually less than one-tenth." Thus King could not count the individuals of 6 out of 9 items of food in stomachs of Blue Jays, and must express himself in percentages, in order to explain that the item — beetles — apparently

¹ See particularly the accounts of *Molpastes bengalensis*, *Oriolus kundoo*, *Acridotheres tristis*, *Sturnopastor contra*, *Turtur suratensis* *T. risorius*, and *Franco-linus vulgaris*.

second in importance, "never composed more than one-fifth of the entire contents [of stomachs], and usually less than one-tenth."

It should be pointed out also that the numerical system would be of no use at all in the case of a majority of mammal stomachs as the food is so finely ground. Comminuted food presents no great obstacles to percentage estimation, however, as nearly all of its can be reckoned in the account by this system. Lord Kelvin has said "When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of science." It follows therefore that a method of estimating bird food which is powerless to express anything about a considerable portion of the food, has "scarcely advanced to the stage of science."

Under the numerical system, the tendency is for insects or other food elements with very resistant parts to get an undue representation among the items contained in the stomachs. For instance the mandibles of grasshoppers or of beetles or certain stony seeds may persist in the stomach while one or more meals following that from which they are derived, have been eaten and digested. When numbers only are used we must count one insect for each pair of mandibles, and it often happens that the numerical majority of the insects in a stomach, form but a small proportion of the food. Under the percentage-by-bulk system the error due to the presence of relics of past meals, is reduced to the minimum.¹

The reason is that in examining large series of stomachs inequalities of size tend to balance each other. The insects being entire, a grasshopper will equal in bulk say 10 of a certain species of carabid beetle, but another stomach may contain the jaws of 20 or more grasshoppers and only one of the carabids, which, however,

¹ It should not be understood from this and following remarks, that the writer believes in the long persistence of food particles in birds' stomachs, for his position is just the reverse. What is meant is that in the great majority of birds, digestion is a continuous process, and what may be termed a meal, i. e. a stomach full of freshly taken food, is generally accompanied by the harder portions of one, or perhaps more than one previous "meal." It is probable that only in rare cases is any particle of food retained in a stomach more than a few hours.

will exceed the former in bulk. If only the tibial plate of a grasshopper is present, a mosquito will far exceed it in size, and will get a correspondingly greater percentage. Under the numerical system we would write down one grasshopper and one mosquito, and none could guess that the mosquito was a real component of the present meal, and the grasshopper a mere trace of a meal gone by. A small ant may thus surpass in bulk the remains (accessory genital glands) of several much larger moths, and so on. Long series of stomachs, taken in many localities at all seasons, tend to smooth over the irregularities due to differences in size. This happens because the present meal being greatest in bulk always gets chief recognition, and past meals represented by mere traces, receive little or no percentage valuation. A large series of stomachs yields many present meals of all the important food elements. Each of these elements therefore is represented in the stomachs by numerous freshly taken specimens which receive full percentage allowance, as well as by residual traces which add little to the total proportion. Approximate proportionate representation is thus assured.

On the other hand if we use the numerical system, an insect or other food item receives the same recognition if represented by a mere trace as it would if entire. In summing up the food of a number of individuals therefore, instead of getting a cross-section as it were of the various typical meals, we get records of the more durable elements of meals piled on each other, until an entirely false idea of the food is obtained.

Dr. Fisher justly observes that this is not the case with the majority of the birds of prey, which disgorge the less digestible remains of each meal, leaving the stomach entirely empty. It is probable that a numerical system is better adapted to stating the food of these birds than of any other group.

In the writer's opinion the estimation of the percentage of food items by bulk, logically rests on the firm foundation of a bird's natural requirement of a certain average quantity of food per day. A bird, just as a man, needs a certain food value, or number of calories per day,¹ and in the long run, this is obtained from a

¹ Dieticians make their computations on the basis of weight, and one economic ornithologist — Rörig of Germany — has used dry weights in part of his work. But these methods consume much time and are probably unnecessary for the degree of accuracy now required in economic work. Estimation of bulk percentages comes nearest in scientific accuracy to weighing.

certain average bulk of food. We thus have for each species a standard of food consumption, by which we can compute its demands for any multiple or fraction of the standard period. The number of insects, seeds, etc., consumed cannot be so standardized. This is true partly because, many of the items cannot be counted (as explained above), and partly because the elements of food vary so much in size. Thus a bird may take as a certain proportion of its subsistence, 10 grasshoppers, or it may take instead 50 beetles, or 1000 ants. In view of this fact what does it mean to say so many birds took a certain number of beneficial and a certain number of injurious insects. Can we possibly learn by numbers their relation to the whole food? It is perfectly evident that a bird requires, not a certain number of insects and seeds per day, but a certain average bulk of food, which may be made up of an exceedingly wide variety of items of very diverse sizes. It follows therefore that we can estimate the importance of any element of the diet, only when we know its proportion to the standard requirement.

We must express ourselves in terms of bulk also when we desire to state the amount of damage done to crops. The cultivator wishes to know how many quarts of cherries or pecks of grain the birds are apt to destroy in a year. We can make these estimates with greatest accuracy when we know the proportion of the annual food of birds, composed of these items.

Suppose, using the numerical system, we say we have examined 100 Crow stomachs and found in them 675 kernels of corn. What does this mean? Can we learn by a numerical comparison with the grasshoppers, or acorns eaten, what proportion of the yearly food consists of corn? The case is different if we can say that corn constituted 15 per cent of the food of these 100 Crows. We then know something about the Crows' relative taste for corn, know that they could have taken much more, but chose to eat other things. The farmer in the locality in which they were collected knows from such a statement about what damage he may expect from Crows.

Without the percentage-by-bulk system the writer would have been unable to make the following statements¹ regarding the food of the Black-headed Grosbeak, namely: "that the animal food of

¹ Bull. 32, Biol. Survey, 1908, p. 76.

the Black-head, consisting almost wholly of injurious insects, is practically twice the bulk of the vegetable food, or more than four times that portion which is pilfered from man"; and that "for every quart of fruit eaten, more than 3 pints of black olive scales and more than a quart of flower-beetles, besides a generous sprinkling of codling moth pupæ and cankerworms fall prey to this grosbeak."

The percentage-by-bulk system has a further advantage in that it indicates approximately the proportion of the total feeding time a bird spends in eating the various elements of its food. For instance, if we state that a certain Blackbird spends about half its time eating grain, as we may with approximate truth if 50 per cent of its food is grain, we present this fact in a much more graphic way, than we would be able to do, were our knowledge confined to the number of kernels contained in a series of stomachs. The writer expressed this idea in a slightly different form when writing about the food of wild ducks. He then said:¹ "Although on first thought a percentage of less than 5 for wild rice may seem small it really means that these 16 species of ducks get a twentieth of their annual subsistence from this grain; in other words, the quantity they eat would support them for two and a half weeks, if wild rice were fed upon exclusively. Similarly, wild celery, which forms 6.65 per cent of their food, would suffice for three and a half weeks; and pondweeds, which form 13.88 per cent, for more than seven weeks."

These illuminating expressions of the importance of various items of bird food are impossible under any numerical system. Neither does a numerical system supply the basis for graphic representation of the proportions of bird food, such as the sectors of circles method devised by Judd,² the curve plottings introduced by Professor Beal,³ or the shaded columns used by the writer.⁴

The chief beauty of the percentage system however is that it permits those comparisons of one part of a bird's diet with another part, or the food of one species or group of species with that of

¹ Circular 81, Biol. Survey, 1911, p. 2.

² See Yearbook U. S. Dep't of Agriculture, 1900.

³ See Bull. 13, Biol. Survey.

⁴ See Bull. 23, Biol. Survey, 1905, p. 29.

another, which are a *sine qua non* in scientific economics. It means so little to say for instance as Mason does: "Of 110 insects taken by 35 birds [Common Mynah], 58 are injurious, 5 beneficial and 47 neutral," (p. 103) and "of 39 insects taken by 14 birds [Pied Mynah], 1 is beneficial, 25 injurious, and 13 neutral." (p. 109). How can the import of these figures be judged unless they are put into proportions? And they cannot be so compared, from the data given, since the insects are of many sizes, and consequently of varying economic importance.

But when we read that weed seeds form 36 per cent of the annual food of the Cardinal and 15 per cent of the diet of the Rose-breasted Grosbeak, we can appreciate at once the comparative value of weed seed as food to these two birds, and the rank of the species as destroyers of weed seeds. Citation of long lists of the numbers of neutral, beneficial and injurious insects which are not susceptible of direct comparison, soon confuses the mind, while the same facts expressed in percentages have directness and clearness obtainable in no other way.

Professor S. A. Forbes, the pioneer economic ornithologist, whose skillful laboratory work and clear thinking, laid so firm a foundation for subsequent workers in this field, adopted the percentage-by-bulk method. He explains¹ that in stomach examination "opportunity is afforded for careful and trustworthy estimates of the ratios each element bears to the other, so that the average significance of the food can be discovered. Practically, this is indispensable. Whatever method fails of this, while its results may be interesting, and may have a certain general value, can never afford a basis for anything better than indefinite opinion. It can never settle the case for or against the birds.

"This method, while by far the best of the three, has its slight disadvantages. Some things eaten by birds leave no appreciable trace in the stomach. For example, it is difficult, by this method, to determine with certainty those birds which greatly injure grapes by breaking the skin of the fruit and sipping the juice. This difficulty applies only to liquid food. Other errors may arise from the shorter or longer periods for which different kinds of food will last in the stomach; but of this we have no proof. I have

¹ Bull. Ill. State Lab. Nat. Hist., Vol. I, No. 3, 1880.

depended almost entirely on this...method of investigation, because it is evidently the most profitable and reliable, and because the method of cursory observation having been resorted to heretofore, most of the recorded facts are due to it. So far as one method could correct the deficiencies of the other, it was desirable that this more tedious and laborious but more fruitful one should be given greater prominence." (pp. 87-88).

The volumetric method of stomach analysis has twice received official sanction by the Biological Survey. In 1895 Professor W. B. Barrows wrote that "In the case of a bird which eats insects only it might be possible to use the numerical method with some accuracy; yet even then much would have to be left to individual judgment in estimating how many small insects were equivalent to one large one, or how many harmful insects would be necessary to offset the consumption of a given number of beneficial insects. Moreover, only under the most favorable circumstances would it be possible to determine just how many individuals of each kind were represented in the stomach contents, for, even if swallowed whole, so soon as digestion begins the individual insects become dismembered, crushed and broken, and within a short time only the hardest parts, such as heads, wing covers, legs, and jaws, remain in recognizable condition.

"It has seemed best, therefore, in attempting to determine the proportions of the various food substances in Crow stomachs, to depend upon the method of equal masses or bulks, which method is adopted in the present bulletin. In most cases the number of individual seeds, insects, or other animals has been recorded also, but these numbers have not been considered in determining percentages." ¹

In 1901 Dr. Sylvester D. Judd in describing the process of stomach examination said: "After each element in a bird's stomach has been identified and placed in a separate pile, the percentages of the different elements are estimated by volume. (Of course it must be understood that mathematical exactness is not attainable in these examinations; but every possible means is taken to reduce the error to a minimum, and with a sufficient number of stomachs a very correct idea may be obtained of the proportions of the

¹ Bull. 6, Biological Survey, 1895, pp. 28-29.

different elements of the food.) [A footnote in original]. In recording the results of examinations a separate record is made for each species and for each month. Monthly averages are based on the number of stomachs collected in the month, but yearly averages are determined from the monthly averages; for unless the collections of stomachs were much more evenly distributed as to months than they are at present, an average based directly on the number of stomachs collected in the year would be misleading."

The results would be just so much more accurate if the abundance and distribution of material warranted reduction of the time-unit to a week, or better a day. The writer has proposed also, as a further step toward accuracy, to reduce the disturbing effect of peculiar local conditions by averaging the contents of stomachs collected in one locality in the same month, and giving such averages (of more than a certain minimum number of stomach contents) equal weights in the monthly tabulation.

SUMMARY.

The principal objection to the method of reckoning the contents of bird stomachs solely by the number of individual insects or seeds, is that the method takes no account of size of the objects, and hence conveys no idea to those unacquainted with the groups concerned of the relative importance of the food elements.

Size has much to do with economic status — i. e., capacity for good or harm — and it receives proper recognition only under the percentage-by-bulk system.

We have shown furthermore that statements as to the frequency with which certain food items are taken by birds, by no means indicate the importance of these items in the diet of the species. Under the volumetric method however, the proportions the various elements contribute to the animal's subsistence are evident at a glance, and the animal's capacity for good and for harm are clearly shown.

Numerical notations in most cases greatly exaggerate the im-

¹ Bull. 15, Biological Survey, 1901, pp. 14-15.

portance of elements of the food that have parts very resistant to digestion, a difficulty which is reduced to the minimum when proportions are estimated according to the volumes.

Numerical systems are not sufficiently comprehensive. Finely comminuted, fleshy, or pulpy food, or food occurring in indefinite masses cannot be reckoned by numbers. Under the percentage-by-bulk system, all food can be included in the computations. Intelligible comparison of one part of the diet with another or of the food of one species or group of species with that of another, as well as graphic representation of the proportions of the food, are only possible when the volumetric method is used. This system is the better therefore, as the more complete is always superior to the less.

On the other hand statements of the frequency of occurrence of food items in bird stomachs may perhaps be taken as rough indices of availability of the food or of relish for it. And statements of the number of individuals in stomachs have an interest as "records," the interest being in direct proportion to the bigness of the number.

The ideal system from the writer's point of view is one that combines the good points of both the numerical and volumetric methods — a system which, as a matter of record, counts individuals as far as possible, or at least in enough instances to assure the inclusion of typical cases, and which further estimates the proportion of all important items by bulk. Such a system has been approved and used by Forbes, Beal, Barrows, Kalmbach, Judd, Sanderson, Dearborn, Weed and the writer, among American investigators. The consistency with which it has been applied is in striking contrast to the vagaries of numerical systems which have scarcely been used alike by any two writers. We have shown that the chief criticisms that have been aimed against the volumetric system, apply equally well to the numerical methods. The latter have other weak points that do not appear in the percentage-by-bulk system, and the few good points peculiar to the numerical system can profitably be combined with the volumetric method. This gives us a compromise technique that contains all of the good features and a minimum of the weaknesses of its components.

THE BREEDING BIRDS OF SOUTHERN CENTER
COUNTY, PENNSYLVANIA.

BY RICHARD C. HARLOW.

THE object of the present paper is to set forth in a systematic way, the results achieved by the author during four years of systematic ornithological investigation in southern Center County, Pennsylvania. The period covered by the observations is from September 1, 1908, to May 20, 1912, with the exception of the summers of 1909 and 1910, when field work stopped about June 10. Observations were made in eastern Ferguson township; Patton township, southeast of Buffalo Run; College township, and the western and southern parts of Harris township. A few records are included in this paper which are based on data collected in parts of Jackson and Brown townships, Huntingdon County, near the Center County line, which seems legitimate since the physiography of the adjoining parts of the two counties is essentially the same and moreover, all the species nesting in this part of Huntingdon County, with one exception, have been found in the adjacent regions of Center County.

So far as identification of species and authenticity of the records are concerned it has been the policy of the author to include no record of which there is the slightest doubt, as misleading statements and erroneous identification are all too common at the present time. A hypothetical list is given where are placed various species whose status is not beyond question and other species, not found as yet, but whose occurrence as breeders is to be hoped for in this locality. The data gathered represent the work of a vast number of field trips during the last four breeding seasons. Certain regions, especially Stone Valley, Huntingdon County; Tussey Valley, Center County: and all of College township, Nittany Valley have been studied quite extensively and the list for these localities is probably nearly complete.

Up to the present time there has been very little published on the birds of this section, and that little has undoubtedly been misleading to a certain extent. A previous paper on this subject

contains many errors and statements that will not stand the test of true scientific questioning, although all credit is due its author and much of his work is of great value. Mr. W. E. C. Todd of Pittsburg made a number of observations here about 1895, but with the exception of Mr. Todd and Mr. Musgrave, practically no ornithological work has been done in this region until Mr. Foster White and the author began their studies in 1908. The previous lack of data, in many respects made the work all the more pleasing for every observation was of value.

According to Bulletin No. 10 of the Bureau of Biological Survey, U. S. Department of Agriculture, all of Center County lies in the Alleghanian faunal area of the Transition Zone. However, since that time, Mr. Samuel N. Rhoads in his "Mammals of Pennsylvania and New Jersey" includes all of Center County northwest of the Bald Eagle range, in the Canadian Zone, and all southwest of this range in the Alleghanian. The truth would seem to lie between the two, and the author believes that here as in other sections of the Pennsylvania mountains where primeval conditions are rapidly changing, we find a remarkable overlapping of faunas. It is essentially a region of unexpected realities and unrealized expectancies, where Canadian and Carolinian species nest side by side. Here we find the Tufted Tit summering in the same ravine as the Magnolia Warbler while even more striking is the sight of the Acadian Flycatcher and the Canadian Warbler feeding their young in neighboring bushes. Southwest of the main ridge of the Alleghanies, Stone Valley, Huntingdon County, and Bear Meadows, Center County seem to approach nearest to the typical Canadian Life Zone, but even in these places many boreal species are lacking and many austral species are present to disprove this statement.

Center County occupies the very center of the state of Pennsylvania, the 'Keystone of the Keystone' as it were, and stretches away like an irregular lozenge with the oblong ends pointing northeast and southwest. It is bounded on the northwest by Clearfield County; on the northeast by Clinton, Union and Snyder; on the south by Huntingdon and by Blair on the southwest. Its area is 1230 square miles, thus making it the largest county in the state. The Bald Eagle Mountains divide the county nearly in half; to the northwest, stretches the main ridge of the Alleghanies; to the

southwest the country is rolling and mountainous with several broad valleys. Most of the appended data was collected in the Nittany Valley and along the Huntington County line. This region is remarkable for its lack of large bodies of water, and this feature accounts to a great extent for the few water birds which nest here and also for the fact that the bird life is most abundant in the valleys along the mountain streams. A detailed account of several places which have been marked by certain types of bird life follows so that the reader may better understand the various allusions to these localities.

Some two miles to the west of State College we find the "Barrens" a peculiar tract of land with sandy soil and underground drainage. The original stands of lumber were cut years ago and repeated fires have kept down reproduction so that now we find a tract, miles in extent with a dense second growth of scrub oak, white oak, pitch pine and quaking aspen. Here and there we see scattered patches of woodland but the region is featured by its dense undergrowth and lack of large timber.

About one mile to the northeast of State College, Thompson's spring gives rise to a creek, locally known as Sand Run. Just below Center Furnace this creek is bordered on the southeast by a marsh, several acres in extent. A luxuriant growth of marsh grasses, marsh marigold and reeds, along with a few bushes and cat-tails, make the location a paradise for swamp-loving birds. The water varies from one to twenty-four inches in depth with an average of perhaps four inches.

Between the first and second ridges of the Seven Mountains, lies the narrow first valley with its streams bordered by masses of rhododendrons and a few scattering hemlocks, mute witnesses of the greed of the lumberman. Farther up on the ridges we find groves of pitch pine and Table Mountain pine, chestnut oak and red oak.

Farther back in the mountains between the third and fourth ridges lies the section known as Bear Meadows with an altitude of 2200 feet. Here pitcher-plants, sundews and cranberries grow in profusion while the black spruce and balsam recall at once the northern bogs. The undergrowth consists of an almost impenetrable jungle of rhododendron, and here yet linger the bear, the deer, and the porcupine, secure in their mountain retreat.

Farther down the valley and across the line in Huntington County we find the section known as Stone Valley. The population is sparse and many of the residents consider it an event of their lives to visit State College, only eleven miles away. Here Laurel run wends its way through dense rhododendron thickets with a scattering shade of hemlock, mostly second growth, black birch and yellow birch. Several slashings occur along the old lumber roads where the undergrowth is almost impenetrable and where we find occasional giant dead hemlocks still standing, spurned by the axeman on account of some defect.

The typical woodlot of the region is composed of black and scarlet oaks, shagbark and white hickory, pitch pine and white oak. Several stands of white pine occur, but mostly as second growth.

It is the desire of the author to express his thanks especially to Mr. Foster White, to whose conscientious and indefatigable labors much of the success of these investigations is due. Mr. David Harrower has also given me free access to his notes on the birds of this region, many of which are of great value. Thanks are also due to Messrs. Douglass Spencer, Herbert Mathers and Frank Craighead for valuable assistance, and lastly, the author wishes to thank Professor W. R. McConnell of the Department of Zoology of State College for the assistance and encouragement he has always so willingly tendered.

The list of breeding birds of southern Center County follows.

1. *Butorides virescens virescens*. GREEN HERON.—Regular and fairly common summer resident in suitable locations. Prefers small groves or orchards in the vicinity of water and usually nests in the highest branches. Have examined two nests in this vicinity. The first was found May 22, 1909, and was built 25 feet up in the top of an apple tree in an orchard. It contained five fresh eggs. The second nest was found after the young had flown and was 30 feet up in a box elder, in an open grove along a stream. Both were near Thompson's spring.

2. *Rallus virginianus*. VIRGINIA RAIL.—Regular and common summer resident in the swamps at Center Furnace and probably elsewhere. In 1909 three sets of ten eggs each were collected here on June 7. One set was fresh and the others far incubated. In 1910 the birds were present but no extended search was made for their nests and in 1911 one set was found at the same place and one set of 10 eggs was taken May 28, 1912. They choose the drier parts of the marsh in which to nest while the Sora

Rail usually builds over deeper water. Sets are usually complete by June 1, and the female commences incubation with the first egg laid.

3. *Perzama carolina*. SORA.—Regular and apparently more common summer resident than the Virginia Rail, in the same swamp. The Sora Rail usually builds several nests which are either used as shams or abandoned before the eggs are laid. The following occupied nests have been found.

June 7, 1909. Ten fresh eggs.

June 7, 1909. One fresh egg.

June 7, 1909. Six hatching eggs, three newly hatched Rails.

June 6, 1910. Eleven far incubated eggs.

June 6, 1910. Nine far incubated eggs.

May 28, 1912. Twelve fresh eggs.

In 1911 the birds were seen in their usual numbers but no search was made for their nests.

4. *Philohela minor*. WOODCOCK.—Regular and fairly common summer resident in the swampy bottomlands in the mountains. Has been noted throughout every breeding season in the vicinity of Stone Valley and Bear Meadows. April 29, 1911, Mr. White and I observed four male Woodcocks giving their aerial flight song in the twilight near Stone Valley. The locality was in the bottom-lands of Laurel Run which are largely covered with second growth. Mr. Douglas Spencer found a female with four newly hatched young in this vicinity, May 15, 1911.

5. *Actitis macularia*. SPOTTED SANDPIPER.—Common summer resident; found about all creeks and bodies of water in the open country, but usually nesting back from the water in cultivated fields or bushy pastures.

6. *Oxyechus vociferus*. KILLDEER.—The same remarks apply to this species though it is usually more noticeable than the Spotted Sandpiper. Nests almost entirely back from the water in the cultivated fields.

7. *Bonasa umbellus umbellus*. RUFFED GROUSE.—An abundant permanent resident throughout the mountains and also found commonly in the Barrens. During late April, the drumming may be heard throughout the day in these localities and the birds are frequently flushed. Though the birds are abundant, but two nests have come to my notice. One of these was found by a student while trout fishing near Pine Grove and held ten hatching eggs on May 23, 1910. The other was found by Mr. David Harrower and held six fresh eggs in June, 1911.

8. *Meleagris gallopavo silvestris*. WILD TURKEY.—Regular and tolerably common permanent resident, though rarely seen. I have observed Wild Turkeys or their tracks in the Barrens, near Stone Valley and along Mount Nittany, and the birds breed in all these localities. They are reputed to be fairly common near Buffalo run in Patton township and the farmers tell me that they frequently see the young in company with the parent feeding in the open fields near the woods.

9. *Zenaidura macroura carolinensis*. MOURNING DOVE.—Quite

common summer resident throughout the region and nesting in all localities except the deep woods. Found quite commonly about old estates in pines, in old orchards or in open groves of pine in the mountains. Has been found breeding from the ground up to twenty-five feet, usually at the base of limbs but sometimes in hollows. Eggs have been found as early as April 17, 1910, and as late as July 23, 1911, in the latter instance they were far incubated.

10. *Cathartes aura septentrionalis*. TURKEY VULTURE.—The Turkey Vulture may usually be seen on any day throughout the summer, and undoubtedly breeds at certain localities in the mountains though no nests have been found. During late June the author has observed them frequently about Bald Knob and sailing over the Tussey Valley and has sought vainly for their nests in the rock ledges at Shingletown Gap.

11. *Accipiter cooperi*. COOPER'S HAWK.—The most common breeder of our larger hawks. Nests regularly either in the larger woodlots through the more open country or in the denser mountain forests. The following occupied nests have been found.

May 4, 1909. Four slightly incubated eggs.

April 28, 1910. Five fresh eggs.

May 14, 1910. Four incubated eggs.

May 2, 1912. Three fresh eggs.

Two nests were located while in the process of building in 1911, but circumstances prevented later investigations.

12. *Buteo borealis borealis*. RED-TAILED HAWK.—An uncommon permanent resident. The author has not found the nest of this bird, though he has several times observed it in the breeding season. Mr. Douglass Spencer informs me that he observed several of these birds in early April, 1911, near Fillmore.

13. *Buteo platypterus*. BROAD-WINGED HAWK.—A regular but rather scarce summer resident; its range apparently limited to the vicinity of the mountain streams in the gaps and ravines. The Broad-winged Hawk has been observed in the breeding season in Stone Valley, Shingletown Gap, in Bear Meadows, and near Pine Grove Mills. The following nests have been found.

May 8, 1910. Two fresh eggs.

July 1, 1911. One downy young hawk probably ten days old.

Both these nests were on the banks of mountain streams, the first in a hemlock and the second in a dead yellow birch.

14. *Falco sparverius sparverius*. SPARROW HAWK.—Common summer resident throughout the open country, nesting either in solitary trees or in small woodlots. The Sparrow Hawk always nests in a hollow, but the size may vary from a small Flicker's hole to an enormous natural cavity, two feet in diameter. A number of nests have been found—the earliest with five half-incubated eggs on April 26, 1910, near Lemont and the latest with four slightly incubated eggs on May 27, 1910, near State College.

15. **Otus asio asio.** SCREECH OWL.—Common permanent resident throughout the open country. In spite of the fact that the author has found but one nest, he has often seen the young birds still in the down and at least two pairs breed on the College campus. Screech Owls here show a marked preference for holes in old orchard trees and in large elms along the creeks. The gray form is more prevalent here. A nest with three eggs found April 13, 1912.

16. **Bubo virginianus virginianus.** GREAT HORNED OWL.—A rare but regular permanent resident apparently restricted to the wilder mountainous regions. It has been noticed in the vicinity of Bald Knob, Bear Meadows and Stone Valley. In spite of diligent search, no nests have been found, but the birds have been seen Feb. 25, 1910, during their breeding season near Monroe Furnace.

17. **Coccyzus americanus americanus.** YELLOW-BILLED CUCKOO.—Regular, but rather uncommon summer resident, most frequently found in second growth, or damp thickets in the more open country where it breeds.

18. **Coccyzus erythrophthalmus.** BLACK-BILLED CUCKOO.—Scarce summer resident, the more frequent form in the thickets and second growth of the mountainous regions in the vicinity of Bald Knob, Bear Meadows and Stone Valley.

19. **Ceryle alcyon alcyon.** BELTED KINGFISHER.—Regular and fairly common summer resident in suitable localities throughout the more open country. Rarer along the mountain streams. The Kingfisher builds either in the banks of streams or less commonly in quarries or sand banks remote from water. The following nests have been found.

May 22, 1909. One fresh egg.

May 11, 1910. Six fresh eggs.

May 18, 1912. Seven incubated eggs.

20. **Dryobates villosus villosus.** HAIRY WOODPECKER.—Scarce permanent resident in the larger bodies of timber; most frequently found along the base of the mountains. It has been noted throughout the breeding season near Pine Grove Mills, in Stone Valley and along the base of Mount Nittany, near McBride's Gap and at Waddles.

21. **Dryobates pubescens medianus.** DOWNY WOODPECKER.—A very common permanent resident in the open country, but its nests are difficult to find. During the breeding season it is most frequently observed in woodlots, groups of trees near streams, or in orchards. In the mountains it is uncommon. We have noted but two nests. The first was found May 30, 1909, and contained four half fledged young, while the second held a completed set of 5 eggs on May 19, 1912.

22. **Phloeotomus pileatus abieticola.** NORTHERN PILEATED WOODPECKER.—A scarce permanent resident now restricted to the mountainous districts and the wilder portions of the barrens. The extreme shyness of these birds renders observation most difficult. The Pileated Woodpecker occurs regularly throughout the breeding season in the wild, almost im-

penetrable swamps and slashings of Stone Valley and Bear Meadows. One nest with two fresh eggs was found May 2, 1912.

23. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—An abundant summer resident throughout the open valleys, nesting in practically every woodlot and orchard about State College and the adjoining towns and sometimes raising two broods in a season. From a number of nests examined, the earliest with six fresh eggs was found May 26, 1910, and the latest with four fresh eggs on July 10, 1911.

24. *Colaptes auratus luteus*. NORTHERN FLICKER.—An abundant summer resident throughout the open valleys nesting most frequently in orchards and woodlots. Less common in the more open mountain forests. Earliest nest examined held eleven eggs on May 9, 1910; latest nest June 7, 1910, with seven fresh eggs. The average date when sets are completed is May 12.

25. *Antrostomus vociferus vociferus*. WHIP-POOR-WILL.—Quite common summer resident throughout the mountain forests. It apparently does not breed in the more open country.

26. *Chordeiles virginianus virginianus*. NIGHTHAWK.—Rare summer resident in the open country. Found about old fields where there is an outcrop of flat stones.

27. *Chaetura pelagica*. CHIMNEY SWIFT.—The Swift is an abundant summer resident throughout the open country about houses and, in fact, wherever suitable chimneys are found where it may nest. Large numbers breed in the capped chimneys of the chemistry building on the College campus.

28. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.—Regular but rather scarce summer resident in the open valleys as well as along the borders of the mountain forests. In the open country it breeds about estates, in woodlands and in orchards. I have found but one nest, which contained two fresh eggs on June 7, 1909. This was built in the College orchard.

29. *Tyrannus tyrannus*. KINGBIRD.—Abundant summer resident of the open or cleared valleys, where it nests in nearly every fruit orchard. The average time for complete sets of eggs is about June 6.

30. *Myiarchus crinitus*. CRESTED FLYCATCHER.—Very common summer resident throughout the valleys and open woodland, nesting most abundantly in old apple orchards. The usual time for complete sets of eggs is about June 5.

31. *Sayornis phoebe*. PHOEBE.—Very abundant summer resident, nesting indiscriminately about out-houses, barns, ruined buildings, under bridges or on the sides of rock ledges in the mountains. Near Pine Grove in an old ore furnace, a nest of Phoebe was found with six distinct stories. Average time for first sets April 28.

32. *Myiochanes virens*. WOOD PEWEE.—Abundant summer resident, nesting usually in open woods, orchards or about estates. But three nests have come to my notice.

No. 1. June 20, 1911. Two fresh eggs.

No. 2. June 29, 1911. Two fresh eggs.

No. 3. August 7, 1911. Two half fledged young.

33. *Empidonax virescens*. ACADIAN FLYCATCHER.— Rare summer resident along the mountain streams. Have observed it several times in 1910 in Huntingdon County where two old nests were found. In July, 1911, a female with two young was seen between First and Second mountains.

34. *Empidonax minimus*. LEAST FLYCATCHER.— Rare summer resident in small groves or fruit orchards. Usually about one pair is seen throughout the breeding season but no nests have been found.

35. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.— Summer resident in the open fields of the valleys, varying in abundance. In 1909 and 1912 they were fairly common, while in 1910 and 1911 they were very rare. No nests have been found though the birds have been observed in every month of the year.

36. *Cyanocitta cristata cristata*. BLUE JAY.— Regular but scarce summer resident in the wooded areas, most frequently found along the mountain trails. A nest with five eggs was found in Stone Valley, May 8, 1910.

37. *Corvus corax principalis*. NORTHERN RAVEN.— Rare but regular resident in the wilder sections, nesting in ledges of rocks. Usually has complete sets by March 5. (Cf. Cassinia, 1910, p. 11.)

38. *Corvus brachyrhynchos brachyrhynchos*. CROW.— Very abundant breeder, being especially abundant in the medium sized woodlots in the valleys. Incubation begins about April 10, the eggs numbering four or five.

39. *Molothrus ater ater*. COWBIRD.— Breeds regularly but infrequently throughout the open valleys, laying from May 20 to June 5. In this region its eggs have been found in the nests of the Chipping Sparrow, Red-eyed Vireo, White-breasted Nuthatch, Phoebe and Bluebird.

40. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.— Breeds abundantly throughout the open country wherever there are any small swamps, several pairs often nesting close together. The complete set of three or four eggs is laid from May 20 to May 25.

41. *Sturnella magna magna*. MEADOWLARK.— Abundant summer resident in grassy fields through the valleys, but its nests are hard to find. Nesting begins the first week in May and two broods are reared.

42. *Icterus spurius*. ORCHARD ORIOLE.— Scarce but regular summer resident in orchards and about estates. I have seen two nests and both Mr. White and Mr. Harrower have found nests with young in late June.

43. *Icterus gabula*. BALTIMORE ORIOLE.— Breeds abundantly in orchards, about estates and especially in elms along streams. Here four eggs are the normal set, while three and five are found less frequently. The eggs are laid about May 25.

44. *Quiscalus quiscula quiscula*. PURPLE GRACKLE.—

45. *Quiscalus quiscula seneus*. BRONZED GRACKLE.— Both forms of the Grackle have been taken here during the nesting season, but the most common form is intermediate between the two. They nest most commonly in coniferous trees about estates and lay their four or five eggs about May 5.

46. *Astragalinus tristis tristis*. GOLDFINCH.— Breeds abundantly throughout the open valleys, in orchards, about estates and in shade trees as well as in patches of second growth. In 1911 I found sets of from four to six eggs, from July 23 to August 11.

47. *Poocetes gramineus gramineus*. VESPER SPARROW.— Breeds abundantly in the open fields, showing a preference for high dry ground and raises two broods. In 1911 I took a set of four eggs on July 24.

48. *Passerculus sandwichensis savanna*. SAVANNAH SPARROW.— Breeds rarely in the open fields of the valleys. My only record is a nest and two far incubated eggs which I collected on July 20, 1911.

49. *Ammodramus savannarum australis*. GRASSHOPPER SPARROW.— Breeds abundantly in the grassy fields and meadows throughout the valleys, but I have not found any occupied nests. On July 20, 1911, a deserted nest with one fresh egg was found.

50. *Spizella passerina passerina*. CHIPPING SPARROW.— Breeds abundantly throughout the valleys, in orchards and shade trees as well as in vines about houses, and raises two broods. The first set of three or four eggs is deposited about May 10.

51. *Spizella pusilla pusilla*. FIELD SPARROW.— Abundant, nesting in old weedy pastures and fields, where there are patches of briars or bushes. Raises two broods and the first set of three or four eggs is laid about May 5 — the second set in early July.

52. *Melospiza melodia melodia*. SONG SPARROW.— Breeds abundantly throughout the open valleys. Two or three broods are reared and the four or five eggs may be found from May 1 until late in August.

53. *Pipilo erythrophthalmus erythrophthalmus*. TOWHEE.— Nests abundantly in second growth in the mountains and about clearings and less commonly in the valleys. On July 19, 1911, a nest with three half incubated eggs was located.

54. *Passerina cyanea*. INDIGO BUNTING.— Regular and fairly common breeder along the border of woods and in second growth and clearings in the mountains, raising two broods. But two nests have been found.

August 17, 1911. Four newly hatched young.

August 18, 1911. Three slightly incubated eggs.

55. *Piranga erythromelas*. SCARLET TANAGER.— Rare breeder and confined mostly to the mountains. It has been noted throughout the summer in Stone Valley but no nests have been found.

56. *Progne subis subis*. PURPLE MARTIN.— Breeds rarely and irregularly. In the summer of 1908 two pairs bred at State College, and two pairs bred in 1912.

57. *Petrochelidon lunifrons lunifrons*. CLIFF SWALLOW.— Regu-

lar but not very common summer resident throughout the cultivated sections.

58. *Hirundo erythrogastra*. BARN SWALLOW.— Very abundant breeder throughout the valleys, nesting in barns or under bridges. Usually completes its sets of four or five eggs by May 10 or May 15.

59. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW.— Regular but not very common breeder along the open streams. Four nests have been located at the following dates.

June 11, 1909. Six newly hatched young, in stones under bridge.

June 11, 1909. Five fresh eggs in Kingfisher's hole.

May 30, 1910. Six fresh eggs in Kingfisher's hole.

May 18, 1912. Five fresh-eggs in Kingfisher's hole.

60. *Bombycilla cedrorum*. CEDAR WAXWING.— Common summer resident nesting in orchards and shade trees. Three occupied nests have been located.

June 20, 1911. Three fresh eggs.

June 29, 1911. Three fresh eggs.

August 17, 1911. Four slightly incubated eggs.

61. *Vireosylva olivacea*. RED-EYED VIREO.— Abundant summer resident in open woodland and about estates as well as in the dense woods of the mountains. Nesting begins about the first week in June.

62. *Vireosylva gilva gilva*. WARBLING VIREO.— Rare but regular summer resident, apparently confined to shade trees along the town streets. Have observed them in Boalsburg and State College throughout the breeding season.

63. *Lanivireo flavifrons*. YELLOW-THROATED VIREO.— Scarce but regular summer resident in open woods, at least two pairs breeding regularly on the College campus, where the young birds have been observed in late June. But one nest has been located which contained four fresh eggs on June 2, 1910.

64. *Mniotilta varia*. BLACK AND WHITE WARBLER.— Regular and fairly common summer resident throughout the mountain forests, where its song is one of the features. But one nest has been found, on May 18, 1910, which held five fresh eggs. The locality was Stone Valley.

65. *Vermivora chrysoptera*. GOLDEN-WINGED WARBLER.— Rare summer resident. One pair was observed near Monroe Furnace on June 3, 1910.

66. *Dendroica aestiva aestiva*. YELLOW WARBLER.— Very common summer resident throughout the open valleys, nesting most frequently in orchards.

67. *Dendroica caerulescens caerulescens*. BLACK-THROATED BLUE WARBLER.— Rare summer resident in the colder laurel swamps of the mountains. Has been observed at Stone Valley and Bear Meadows.

68. *Dendroica magnolia*. MAGNOLIA WARBLER.— Fairly common breeder in the hemlock groves of the mountains, being found most frequently at the gape and along streams.

69. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.— Quite a common breeder throughout, nesting in second growth either in the valleys or in clearings on the mountains. Mr. Harrower has taken several sets of eggs about June 1, near State College.

70. *Dendroica fusca*. BLACKBURNIAN WARBLER.— Scarce summer resident in the more extensive hemlock patches in the mountains.

71. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— Abundant summer resident wherever patches of coniferous timber occur in the mountains. It is especially abundant at Stone Valley and Bear Meadows and Mr. Harrower found one nest near Bald Knob in late June, 1911.

72. *Dendroica vigorsii*. PINE WARBLER.— Fairly common summer resident in patches of pitch, Table Mountain and white pine in the mountains and valleys.

73. *Seiurus aurocapillus*. OVEN-BIRD.— Abundant breeder wherever there is any woodland, either in the mountains or the valleys.

74. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.— Abundant breeder at suitable locations in the mountains, being especially common in the bottom land of Laurel Run, Stone Valley. Here I have taken several sets of three and four eggs and Mr. Harrower has taken a set of five. My earliest date is for four eggs, taken May 14, 1910, and incubated one week.

75. *Geothlypis trichas trichas*. MARYLAND YELLOW-THROAT.— Common summer resident in swampy clearings and damp undergrowth throughout the country. It is not found in the heavy timber.

76. *Icteria virens virens*. YELLOW-BREASTED CHAT.— Rare summer resident in clearings and second growth thickets. One set of four incubated eggs was collected on June 3, 1910, in Stone Valley.

77. *Wilsonia citrina*. HOODED WARBLER.— Abundant summer resident in the thickets of rhododendron and laurel throughout the mountain bottomlands. It is very common in Stone Valley and breeds as near to State College as Shingletown Gap where several broods of young have been observed.

78. *Wilsonia canadensis*. CANADA WARBLER.— Quite common breeder in the same localities as the Hooded Warbler inhabits. July 1, 1911, I found a nest of this bird near Bald Knob with four full fledged young and at the same place, June 7, 1912, took a set of 5 far incubated eggs.

79. *Dumetella carolinensis*. CATBIRD.— Common summer resident throughout the open country, in thickets and second growth.

May 22, 1909. Four fresh eggs.

80. *Toxostoma rufum rufum*. BROWN THRASHER.— Rather scarce breeder, inhabiting the same localities as the Catbird.

81. *Troglodytes aëdon aëdon*. HOUSE WREN.— An abundant summer resident throughout the valleys, nesting most frequently in old orchards or about houses. The usual time for complete sets is about June 1.

82. *Sitta carolinensis carolinensis*. WHITE-BREASTED NUTHATCH.— An abundant breeder in nearly all the forested portions and woodlots.

But two nests have been taken; one May 16, 1910, which held six fresh eggs and one of the Cowbird; and one May 14, 1912, with 7 fresh eggs.

83. *Baeolophus bicolor*. TUFTED TITMOUSE.—Rare summer resident in the woods along the base of the mountains.

84. *Penthestes atricapillus atricapillus*. BLACK-CAPPED CHICKADEE.—Scarce summer resident along the mountain streams. On May 8, 1910, a nest was found in Stone Valley containing seven fresh eggs.

85. *Hylocichla mustelina*. WOOD THRUSH.—Rare breeder and apparently limited to the open, damp bottomlands of the mountains.

86. *Hylocichla fuscescens fuscescens*. VEERY.—Rare breeder in the bottomlands of the mountains. Has been observed twice in the breeding season in Stone Valley.

87. *Planesticus migratorius migratorius*. ROBIN.—Very abundant breeder in the open country, nesting in orchards and about lawns and estates. Sets are usually completed about May 4, and two broods are raised.

88. *Sialia sialis sialis*. BLUEBIRD.—Regular but not very common breeder in the open valleys, nesting most frequently in old orchards. Sets are usually complete about April 20 and two broods are raised.

Hypothetical List.

89. *Botaurus lentiginosus*. BITTERN.—Mr. Spencer observed one specimen in June, 1908, along Laurel Run and Mr. White took one of a pair from the Center Furnace Swamp on May 8, 1909. It probably will be found to be a rare breeder.

90. *Ardea herodias herodias*. GREAT BLUE HERON.—Has been observed several times in April, and may breed in some sections of the mountains.

91. *Colinus virginianus virginianus*. BOB-WHITE.—It has been reported to breed rarely at Boalsburg and Pine Grove, but as yet, I have no corroborative evidence. Several were shot near Pine Grove in October, 1911. One was singing June 24, 1912, at State College.

92. *Circus hudsonius*. MARSH HAWK.—During July, 1911, I saw a bird of this species nearly every day, and again observed one May 6, 1912. It may breed rarely in the swampy meadows.

93. *Accipiter velox*. SHARP-SHINNED HAWK.—Probably breeds rarely in suitable places in the mountains, but as yet no evidence has been procured.

94. *Buteo lineatus lineatus*. RED-SHOULDERED HAWK.—The same remarks apply to this species.

95. *Asio wilsonianus*. LONG-EARED OWL.—This Owl has been taken here in the fall and winter months and may breed rarely.

96. *Strix varia varia*. BARRED OWL.—Probably breeds rarely in suitable localities. Has been observed several times in March.

97. *Dolichonyx oryzivorus*. BOBOLINK.—Mr. Musgrave records a pair observed near Boalsburg by Mr. Todd in June. I have no other records.

98. *Junco hyemalis hyemalis*. SLATE-COLORED JUNCO.—My latest spring record is May 10, 1910. May breed rarely in the mountains.

99. *Melospiza georgiana*. SWAMP SPARROW.—Probably nests rarely at the Center Furnace Swamp but no conclusive evidence has been obtained.

100. *Cardinalis cardinalis cardinalis*. CARDINAL.—The Cardinal may breed in Stone Valley as it has been seen there in May.

101. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBREAK.—This bird occurs in Stone Valley during the migrations and may breed there.

102. *Iridoprocne bicolor*. TREE SWALLOW.—Mr. Musgrave records the Tree Swallow as a common summer resident, but so far, no supporting evidence has been obtained.

103. *Lanius ludovicianus migrans*. MIGRANT SHRIKE.—There is a possibility that this Shrike may breed here and watch should be kept for it.

104. *Compsothlypis americana usnes*. PARULA WARBLER.—Probably breeds rarely at Bear Meadows, as Mr. Musgrave records them from that locality in June.

105. *Setophaga ruticilla*. REDSTART.—May breed rarely but no conclusive evidence has been obtained.

106. *Thryomanes bewicki bewicki*. BEWICK'S WREN.—One was observed near Shingletown, April 13, 1910. It may breed rarely.

107. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—Mr. White and myself observed Marsh Wrens May 30, 1909, at Center Furnace which we referred to this species. It should be looked for in our swampy meadows.



1. SITE OF RED-BREASTED MERGANSER'S NEST.



2. NEST AND EGGS OF RED-BREASTED MERGANSER.

SOME OBSERVATIONS ON THE LIFE-HISTORY OF
THE RED-BREASTED MERGANSER,
MERGUS SERRATOR, LINN.

BY R. M. STRONG.

DURING the summer of 1911, it was the writer's good fortune to be in a locality where Red-breasted Mergansers were breeding in some numbers. Headquarters were established at Ephraim, Door County, Wisconsin; and islands in Green Bay were explored a number of times. Spider Island and Gravel Island, across the peninsula in Lake Michigan, were also visited with the aid of information kindly furnished by Mr. Henry L. Ward of the Milwaukee Public Museum. All of the wooded islands in this region not occupied by man, were found to have nests of the Red-breasted Merganser. On examination of the literature, later, only fragmentary accounts of the life-history of this bird could be found. As these are also much scattered, it has seemed desirable to collect such material as is available with the observations made by the writer into the following article.

The Red-breasted Merganser is generally described as having a wide distribution in the northern part of the northern hemisphere from Alaska eastward even to Japan and China. It breeds in the northern portions of its range. According to Ridgway¹ there are breeding records as far south as northern Illinois.

All of the nests which were found by the writer were on the ground in scrubby growths or among forest underbrush on islands. Mergansers were seen near the shore of the mainland, under circumstances which suggested strongly that they were breeding there also, but no nests were found on the mainland. The general characteristics of the nests and of their locations corresponded to the descriptions given by the authors of various works on birds.

Nest No. 1 was found June 20 at the base of the bush which appears in Plate XXI, fig. 1. It contained only five eggs at this time, and it consisted as usual of a mass of sticks and debris lined

¹ Ridgway, R. *Manual of North American Birds*. Also in *The Ornithology of Illinois*, Vol. II. Part I, p. 189-190.

with a light gray down which also partially covered the eggs. The down occurred in the usual abundance for nests of this species and presented a comfortable appearance.

Another nest which was found nearby was placed in the midst of a patch of nettles (*Urtica gracilis*) and bushes. Other nests were found in various positions of concealment. One was among nettles alongside a large drift-log. The nest shown in Plate XXI, fig. 2 was at the base of a bush in a position similar to that occupied by nest No. 1, but with a drift log at one side. Still another nest was among some roots of a tree on the side of a bank in a little cave which had been formed by erosion of the soil about the base of the tree. Usually the nests were within seventy-five feet of the water, but one was found over one hundred feet away from water, and some fifty feet or more back in dense woods and underbrush. This nest was well concealed by ground conifers, and the brooding female was flushed at my feet. Except when the bird was flushed suddenly from her nest, the eggs were usually found covered more or less completely with down. Dall¹ states that six nests which were found on an island in the Yukon River, Alaska, near its mouth, were all carefully concealed under dry leaves. He found most of the nests in small hollows under logs of drift wood. It is stated by Meyer² that the nest may be placed in a recess many feet deep in a hollow tree. Mr. H. L. Ward, in conversation, told the writer of a nest observed by him in a barrel. Meyer claims that the nest may also be in the top of a tall tree.

Yarrell³ mentions locations under projecting rocks or in thick brushwood. He describes the nest as being composed of moss and lined with down from the bird, and he notes a similarity of the nest both in structure and in materials to that of the Eider Duck. This resemblance was also noticed by Audubon,⁴ but he says that the nest of the Red-breasted Merganser is better-fashioned and considerably smaller. He described the construction as consisting of dry weeds and mosses of various kinds "warmly lined with down from the breast of the female bird."

¹ Baird, Brewer, and Ridgway. *The Water Birds of North America.* Vol. 2, pp. 116-120. Quotes Dall.

² Meyer, H. L. *British Birds.* 1842. Vol. 6, pp. 179-183.

³ Yarrell, W. *A History of British Birds.* 1856. Vol. 3, pp. 392-397.

⁴ Audubon, J. J. *Ornithological Biography.* Vol. V, pp. 92-99.

This species was found by Audubon and also by Dawson and Bowles¹ to prefer the vicinity of fresh water for its nesting place.

The number of eggs in a set is stated somewhat differently by various writers. Thus Audubon found frequently six to eight eggs but never more than ten in a nest. Wilson and Bonaparte² mention eight to thirteen eggs. A female with eleven young was seen by Osgood³ in Alaska. The writer's notes include the following records of the number of eggs in nests where there was evidence that the sets were complete:

One nest contained seven eggs.

Four contained nine eggs.

Two contained ten eggs.

According to a number of authors, the female alone incubates the eggs and rears the young. The writer's limited observations, support this view. No males were observed by the writer about the nests, but they were seen in small flocks in the immediate vicinity, and they sometimes flew near. It was not possible to learn whether they were interested in the nests or not. Maynard⁴ states that males were not seen during the brooding period, but "later when the downy young were swimming in the neighboring ponds both parents birds were present and exhibited considerable solicitude, flying distractedly about, often swimming within a few yards of me."

Though the writer spent several days in the vicinity of a number of nests after the eggs were due to hatch, the young were never seen at close range away from the nest except in one case when only the female was in view. Two nests were found with young just hatched and with eggs hatching. These will be discussed later in this article. Broken shells were found but the young mergansers were usually not to be seen, and they were presumably hidden in the underbrush.

If the brooding female had not already left the nest before the

¹ Dawson, W. S. and Bowles, J. H. *The Birds of Washington*. Vol. II, pp. 760-762.

² Wilson, A. and Bonaparte, C. L. *American Ornithology or the Natural History of the Birds of The United States*. 1877.

³ Osgood, W. H. *A Biological Reconnaissance of the Base of the Alaska Peninsula*. *North American Fauna*. No. 24, p. 55.

⁴ Maynard, C. J. *The Birds of Eastern North America*. pp. 461-462. 1881.

writer landed at the islands where the nests occurred, she flew some distance on being flushed, usually alighting on the water. On several occasions while studying gulls in my tent which had been pitched within a few rods of a merganser nest, the female parent came unconcernedly near. One bird splashed in the water at the shore about one-hundred feet away as though in play or taking a bath. Another waddled by the tent shortly after it was pitched, uttering duck-like quacks as she returned to her nest. On the whole the mergansers seemed to be shy.

In order to study the young more closely than would be possible in the field, some merganser eggs were hatched under a hen. Six eggs were collected on June 26. To keep them warm until they could be placed under a hen, they were carried in a shoe box with three nestling gulls which were also collected on this trip. Three were taken from nest No. 1 which contained only five eggs on the 20th. This nest held nine on the 26th. The other three eggs were obtained from a nest which contained nine eggs both on June 20 and on the 26. This nest will be referred to as No. 2.

The six eggs were placed under a broody hen which was fortunately available at the time on the premises where the writer was boarding. On the morning of July 11, one egg from nest No. 2 was found hatched, and another bird appeared before noon. The third egg did not develop. The writer visited the nest from which these eggs were taken, the next day, July 12, when most of the eggs were found hatched. Apparently the eggs under the hen had made as good progress as those left in the nest with the parent merganser. Two of the eggs from nest No. 1 hatched on July 25, having been under the hen a few hours less than twenty-nine days. This indicates a probable incubation period of about four weeks for the Red-breasted Merganser. Evans¹ in his incubation-period tables quotes Tiedemann as giving 26 to 28 days as the incubation time for this species. (Tiedemann's work has not been accessible to the writer.)

The baby mergansers had the usual attractiveness of newly-hatched precocial birds. The downy young of the Red-breasted

¹ Evans, W. On the Periods occupied by Birds in Incubation. *Ibis*. 1891, Vol. III, Ser. 6, pp. 52-93.

Merganser have been described by Ridgway¹ as follows: "Above, hair-brown, the posterior border of each wing, and a large spot on each side of the rump, yellowish white; lower parts including the malar region, yellowish white; side of head and neck reddish cinnamon, paler on the lores, which are bordered above by a dusky stripe running backward to the anterior angle of the eye, and below by a dark brown, rather indistinct rictal stripe; lower eyelid white." In place of the term reddish cinnamon we may substitute dull or broken shades of orange-yellow which pass over into light tints of this color. The bill and feet are mostly varying shades and tints of olive or a very much "broken" yellow.

During the first few days and especially on the first day, the down feathers are more or less bristly as their barbs are held together very frequently by feather-germ material. The soft fluffiness which is characteristic of a newly-hatched chick does not appear very fully until a few days later. Nestlings hatched by the parent itself in the field showed the same bristly appearance.

Within a few hours after hatching, the young mergansers became quite active, and the two hatched on July 11, were seen in the late afternoon of that day sitting on top of the hen's back, a location they seemed to attain with little trouble. Cory² observed a female merganser bearing a weak nestling on her back and wrote "He scrambled upon her back and nestled snugly down behind her neck....away she went....followed by her brood."

On the next day, the little birds were still more active, and they began to jump towards the upper edge of the box in which the nest was placed. They were also able to move rapidly over the ground, though apparently not yet able to stand on their feet. Locomotion was accomplished by a peculiar wriggling movement of the whole body prostrate on the ground. These movements always suggested those of a snake. When nest No. 2 was visited on July 12, the little mergansers, though apparently not more than a day old and perhaps younger, were very wild; and they were caught with difficulty in the tangle of weeds and brush about their nest. One of these birds was captured and taken home to the hen with her two charges. This third bird appears in the figure which shows

¹ Ridgway, R. *The Ornithology of Illinois.*

² Cory, C. B. *A Naturalist in the Magdalen Islands.* p. 72.

three downy mergansers. The female parent merganser remained on the nest until the writer was within a few feet, before leaving her family. The nestlings seen in this nest and in another exhibited the type of locomotion just described.

A nest which was found on July 15 contained seven young just hatched and one egg. A companion found the nest and took the writer to it. On our approach, the nestlings began to scatter. All but one were caught and replaced in the nest. During the time which was occupied in making several photographs, the young were kept in the nest by a hat which was placed over them. This was removed an instant for each picture. After a few plates had been exposed, the seventh nestling was observed, more than twelve feet away, approaching through a tangle of nettles and other weeds. We stood as still as possible while the little bird came by the most direct route possible towards the nest until it happened to climb on one of the writers's feet where it was captured to be returned to the nest. Presumably these nestlings had never before left the nest. It would be interesting to know how this bird was able to find its way back and why it returned with two men in plain view from whom it had fled in terror a few minutes before. Its nest-mates were not making any noise that the writer could notice.

The three mergansers were removed with the hen to a pen with ample space for exercise, and the other three eggs were placed under another hen. One of these eggs was broken and the other two hatched, as has been said, on July 25. Though apparently strong, one of the young died on the next day and the other a day later.

The problem of what to feed the little mergansers was perplexing. One caught at the nest (No. 2) on July 12, had no food in its stomach, so nothing was gained by this effort to find what the parents were feeding their young. It is commonly stated that the mergansers are fish-eating birds. According to Morris,¹ the Red-breasted Merganser eats small fish, beetles, water insects and their larvæ, worms, and frogs. Meyer² mentions small fish, water beetles, insect-larvæ, worms, and sometimes frogs. It is stated by Jones³ that the young "When first hatched live upon small

¹ Morris, F. O. *A History of British Birds*. Vol. 5, pp. 239-242.

² Meyer, H. L. *British Birds*.

³ Jones, T. R. *Cassell's Book of Birds*. Vol. III, pp. 173-174.



1. RED-BREASTED MERGANSERS, TWO DAYS OLD.



2. RED-BREASTED MERGANSER, THREE WEEKS OLD SWALLOWING
A GRASSHOPPER.

THE
GOLDEN
RULE

crustacea and larvæ, caught upon the surface of the water, but on the third day are able to dive, and from the eighth day are quite capable of fishing for themselves." Robinson¹ found a "small round crab" in the stomach of a male Red-breasted Merganser which was dissected, and more crabs of the same size were seen in the gizzard. All that the writer knew about the food of mergansers when these birds were hatched, was that they eat fish.

As it was not practicable to depend upon fish for feeding the little mergansers, bits of boiled egg and liver were forced into the mouths of the unappreciative and wriggling babies. These attempts met with very little success, and the prospects of rearing any of the birds were not bright. It happened that grasshoppers were exceedingly abundant at the time, and these were tried with success, though one of the birds died on the 13th and another on the 14th. The third began to take the grasshoppers willingly, especially when they were offered by the hen. Two days later, this bird ate eight grasshoppers which averaged over an inch in length, at a single meal. As the writer was away in the field a good deal, the feeding was done irregularly but was attended to at least three or four times a day.

The grasshoppers were often taken directly by the little merganser the moment they dropped to the ground in the pen from the writer's hands, especially when the victim moved. If it remained quiet, it was often overlooked. When the bird was about a week old it would dart after an escaping grasshopper with great speed and skill.

The operation of swallowing a grasshopper usually involved many manipulations. (See Plate XXIII, fig. 2.) Rapid movements of the mandibles and of the whole head for that matter, were involved, and it seemed to be often quite an undertaking. Even when the head-end was taken first, projecting wings or legs caused a lot of trouble. On July 25, thirty grasshoppers of the size mentioned were eaten by this bird.

The hen was given food for her own consumption in the form of grain, and table scraps. These were offered to the merganser persistently by the hen but they were not accepted at first. During

¹ Robinson, H. W. *British Birds*. Vol. II, p. 31.

the third week, some of these table scraps were observed to be eaten by the merganser, especially bits of cooked fish. Cooked fish proved to be the most satisfactory food as it could be kept in an ice box for several days without spoiling and the merganser seemed to thrive on it.

Audubon¹ states that the young of the Red-breasted Merganser go to the water a few hours after hatching and are expert at diving from the first. This is to be expected, of course, as ducklings take to the water at once, though ducks are no more aquatic in their habits than mergansers, and are excelled in diving ability by the latter. The following is taken from Chamberlain's² description: "Soon after they are hatched, the young are led to the water, and at an early age they swim rapidly and dive with great expertness, as I have learned by experience."

Clear spring water was kept for the hen and mergansers in a rectangular pan about two to three inches deep. The little birds were never observed to swim. The three mergansers which appear in the illustrations were all placed in the water, but they jumped out as though frightened. The single bird which lived more than a few days was seen in the pan only twice during the first nine days. On one occasion, it seemed to be enjoying the water though not swimming. On the tenth day the writer's notes contained the following: "Saw merganser in water today when it thrust its bill under water a couple of times. It left the water within a minute after my arrival but I could not tell whether it would have remained in longer if I had not been present." It is a curious fact that the mergansers which died were found lying in the water pan.

The surviving merganser was often seen on the hen's back, and it appeared fully as devoted to her as a chick could be. When separated, the little bird would appear much disturbed, and peeps somewhat resembling those made by a duckling under similar circumstances were made. This devotion is suggested in Plate XXII, fig. 2. On the other hand, one of the nestlings escaped from the box where it was hatched, on the second day. It went

¹ Audubon, J. J. Ornithological Biography.

² Chamberlain, M. A Popular Handbook of Birds. The Ornithology of the United States. Based on Nuttall's Manual. Vol. 2, pp. 360-362.



1. CHARACTERISTIC BREEDING HABITAT OF RED-BREASTED MERGANSER.



2. RED-BREASTED MERGANSER, FOUR WEEKS OLD, WITH FOSTER MOTHER.

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through a barn door and out into the yard where it was found by the writer, about ten rods away lying peacefully on the ground among some chickens.

On August 3, the merganser and hen were placed in a box and taken to Chicago where they arrived safely after a journey of about thirty hours. They were kept in a backyard in Chicago for about ten days. During this time, the view shown in Plate XXII, fig. 2, was taken. The bird was then fat and apparently healthy. When about one month old it was taken to the Lincoln Park Zoological Gardens. The keeper noticed the hen stepping on the merganser and separated them. A day or so later the young bird died and thus ended the hope that a zoological garden might have a live merganser.

As is the case with young ducks, there appears to be little change in the plumage during the first month. In Plate XXII, fig. 2, the merganser is seen to be still in the down plumage. The tail is provided with a set of bristly feathers which have a shaft or rhachis and are in evidence even at hatching.

According to Dawson and Bowles¹ the young birds are nearly full grown before they can fly, but they can flutter over the water very effectively, almost walking on it.

Besides being an expert diver, the Red-breasted Merganser is described by Morris,² Samuels,³ and Dawson and Bowles as sometimes swimming with the body submerged as the grebes do with bill and upper part of the body only above water.

Various writers including Dunn,⁴ Morris,⁵ and Gould⁶ state that the male Red-breasted Merganser undergoes a molt after the female begins incubation. This molt has been described by Stone⁷ for a specimen which was collected in July. The occurrence of a molt at this time would seem to support the view mentioned in this article that the male deserts the female after the eggs are laid and takes no part in the care of the eggs or young.

¹ Dawson and Bowles. *The Birds of Washington.* Vol. II.

² Morris, F. O. *A History of British Birds.*

³ Samuels, E. A. *Our Northern and Eastern Birds.* 1883. p. 526.

⁴ Quoted in Yarrell's "*A History of British Birds.*"

⁵ Morris, F. O. *A History of British Birds.*

⁶ Gould, J. *The Birds of Great Britain.* Vol. V.

⁷ Stone, W. *The Summer Molting Plumage of Certain Ducks.* *Proc. Acad. Nat. Sc. Philadelphia.* 1899. pp. 471-472.

Audubon¹ states that the males are not fully developed until the second year.

The voice of the adult bird is described by Morris² as consisting of a note "*curr, curr.*" The following is taken from Nelson's³ account "The old bird marshalled her brood to the farther side of the pond as I drew near, uttering frequently a low, distinct, but husky, *kha-kha.*" The writer has already noted on p. 4 of this article a resemblance in the voice to that of the domestic duck.

A pair of adult Red-breasted Mergansers with five downy young are figured, natural-size, in one large colored plate by Gould.⁴ The colors are fair, but the positions and the grouping are artificial.

The Red-breasted Merganser usually appears in the region of Chicago in March or early April, though it is reported as sometimes spending the winter in the vicinity. Flocks occur in the lagoons of Jackson Park until early May, and individuals sometimes linger through a large portion of May. It seems probable that nesting does not begin until early June.

¹ Audubon, J. J. *Ornithological Biography*.

² Morris, F. O. *A History of British Birds*.

³ Nelson, E. W. *Report upon Natural History Collections Made in Alaska between the Years 1877 and 1881*. No. III. Arctic Series. U. S. Army Signal Service. p. 67.

⁴ Gould, J. *The Birds of Great Britain*. Vol. V.

REMARKS ON THE CASE OF ROOSEVELT VS. THAYER,
WITH A FEW INDEPENDENT SUGGESTIONS ON
THE CONCEALING COLORATION QUESTION.

BY FRANCIS H. ALLEN.

COLONEL ROOSEVELT in his recent paper on 'Revealing and Concealing Coloration in Birds and Mammals'¹ makes an attack on the work of Messrs. Abbott H. and Gerald H. Thayer and sounds the slogan of 'common sense' as against the Messrs. Thayer's 'wild absurdities,' as he is pleased to term some of the views set forth in their book. Other persons have spoken approvingly of the sound 'common sense' of Roosevelt's paper. Now common sense is an excellent thing; I might go farther and call it indispensable; and yet, with the greatest respect for it, we must admit that it has its limitations. In Columbus's day common sense declared that the world was flat. More recently it carefully protected the consumptive from 'night air.' And, if I mistake not, it is still an obstacle to the spread of scientific education. It is hardly safe, I think, to trust to common sense alone to settle the question of concealing coloration or any other scientific question. It is science that must settle it, though she must call on both common sense and imagination to help her,—imagination as well as common sense, for one without the other would be only a hindrance. Any science that goes deeper or soars higher than the mere accumulation of facts must make use of the imagination.² This is a truism, of course, but it seems necessary to insist upon it a little under the circumstances.

And we must also face the fact that it is not always the best, *i. e.* the most accurate and diligent, observer that makes discover-

¹ Bulletin of the American Museum of Natural History, Vol. XXX, Art. viii, pp. 119-231, New York, August 23, 1911.

² "My success as a man of science, whatever this may have amounted to, has been determined as far as I can judge, by complex and diversified mental qualities and conditions. Of these, the most important have been—the love of science—unbounded patience in long reflecting over any subject—industry in observing and collecting facts—and a *fair share of invention as well as of common sense.*"—Charles Darwin. (The italics are the quoter's.)

ies. It is the thinker rather, never the *mere* observer. It must be admitted, I think, that light on scientific problems sometimes comes from the outside, that is from outside the group of workers who fancy themselves the only ones who know anything about their specialty. Of course we welcome the light no matter what its source, even though it may come from one who has given most of his life to art rather than to science, even though that artist may have adopted a far from deferential tone towards the naturalists whom he is trying to convince.

I cannot help thinking that Mr. Thayer (to save trouble I shall speak of him in the singular number) has prejudiced his case among ornithologists not a little by the manner in which he has presented it. Even more prejudicial than the rather arrogant attitude he seems to take in regard to the relative claims of the artist and the biologist to be entitled to form an opinion on the subject of coloration,— even more prejudicial, if less irritating, is the — shall I call it cocksure? — way in which mere conjectures are stated as facts. His book would have gained much in weight, I think, if a proper distinction had been made between those propositions which were in some sort susceptible of proof and those that should have been put forth only as suggestions. Nevertheless, though the book is far from being a safe guide for the uninstructed, it ought to be possible for scientific men to read it in an unprejudiced spirit, making all proper allowances for the ‘artistic temperament’ that shaped its form. It is a regrettable fact, however, that some reviewers have *seemed* to be more intent upon bringing Mr. Thayer into ridicule than on arriving at the real facts in the case of concealing coloration. ‘Seemed’ I say, for, though perhaps I do them an injustice, that is the impression a reader is bound to carry away with him. Ridicule is a powerful weapon and the temptation to use it unsparingly is a strong one. But I want to ask fair treatment for Mr. Thayer. Even if we don’t agree with him, it is not necessary either to cut him into little pieces or to break every bone in his body with the ‘big stick.’

If we adopt a fair attitude towards Mr. Thayer and his book, we must begin by admitting that by virtue of his profession he is an expert in all matters pertaining to color. A scientific man may know all the artist knows about the laws of light and color,

but no man of science who is not also a painter has the habit of mind that keeps him constantly on the watch for effects of color, pattern, and light and shade. How many ornithologists are in the same class with Mr. Thayer? Mr. Fuertes, perhaps, who agrees with Thayer in the main, but certainly not Dr. Barbour, nor Dr. Phillips, nor Colonel Roosevelt. Mr. Thayer of course cannot as an artist claim exclusive right to weigh the facts and render judgment. That is the office of the scientific men. But he has a right to testify to the facts and to be accorded a respectful hearing. Scientific men will not reject the artist's testimony because he may have the 'artistic temperament,' though it is proper to take that into consideration in determining the admissibility of the evidence. I venture to express the opinion that Mr. Thayer knows more about the coloration of animals in its relation to the concealment of those animals than any other man in this country. Perhaps he knows a few things that 'ain't so,'— personally I think that some of his knowledge does belong to that category,— but it will not do to deny him the credit of a really vast knowledge of this subject. His opinions, therefore, are entitled to respect, much more respect than they have received at the hands of some of his critics.

Mr. Thayer was the first to call attention to the function of counter-shading in the concealment of animals. I think most naturalists admit its importance. We owe Mr. Thayer a debt of gratitude for pointing out this interesting fact. It was because he was an artist that he discovered it,— because he had formed the habit of seeing things as they *looked* rather than as he knew or suspected them to be. Scientific men had been at work on the problems of coloration for many years without discovering this thing that now seems so obvious. We see it now, and we admit it. Perhaps some others of Thayer's discoveries — to use his own word — are less obvious, but that does not make them necessarily any the less truly discoveries. We ought to hesitate to reject them without considering very carefully whether in these other cases the expert in colors and appearances may not be in the right. And again I respectfully suggest that common sense cannot settle the question. Common sense has made up its mind. Open-minded science must settle scientific problems.

Having tried to show why Mr. Thayer should be accorded a considerate hearing, I will now attempt to show why Colonel Roosevelt, with all his wide field experience, is not a safe guide to follow implicitly. I adopt this method of approach because I fear that Roosevelt's paper, following that of Barbour and Phillips, has had a reactionary influence out of proportion to its importance, and I am led to believe that it has not been examined very critically.

I have detected in Roosevelt's paper and the reply to Thayer's criticisms appended thereto upwards of fifty instances of misquotations, misrepresentations, and perversions of Thayer's statements and pieces of faulty reasoning in matters of detail, while the paper is full of dogmatic utterances which must be just as offensive to fair-minded readers as any of Thayer's unguarded overstatements — and more so. A few specimens will be sufficient, I think, to show Roosevelt's inaccurate habit of mind and slapdash style of thinking. In two places (in the footnote on page 156 and on page 220) he instances the photographs of certain birds taken by Messrs. Job, Finley, and Chapman as showing the conspicuousness of those species in a state of nature, quite overlooking the obvious facts that the photographers naturally chose the conspicuous subjects, avoiding those that were at all obscured and getting their cameras into positions where the birds would come out most clearly, and thus made the birds as conspicuous as they possibly could, which was the end and aim of their work. I take it that the birds in most photographs do not appear at all as they would under average conditions in their natural surroundings. Then, on page 162 we are told that the Scissor-tailed Flycatcher is conspicuous in *shape*, but we are not informed how a bird can be conspicuous in shape. I suppose if a row of Kingbirds were pinned against a white screen and a Scissor-tailed Flycatcher were placed in the middle of the row, the latter bird would be made conspicuous by its shape, but how could it be so in its natural surroundings? It is evident that by 'conspicuous' Roosevelt here means unusual, remarkable, but the words are by no means synonymous. I shall have something to say later on this confusion of ideas that tends to call an unusual or brightly colored object conspicuous. As to the Scissor-tail, Roosevelt goes on to say that it is conspicuous

"in color and in habits, has no concealing coloration, and never conceals itself," and that "its long tail merely adds to its already great conspicuousness." Though this is stated as a fact, no evidence is given in support, and we must regard the statement merely as the expression of an opinion,—an opinion which, in view of its author's confusion of mind as to what constitutes conspicuousness, may be taken for what it is worth. One of the most astonishing of Roosevelt's blunders is his failure to see that white cannot possibly show light against a clear moonless night sky. On page 176 he says that "even against the sky line" the white rump of the prongbuck is "always advertising at night"; and on page 179 he says that "at night white is not normally a sky color, . . . so that these white stern marks are *not* 'sky pattern marks' at the very time when, according to his [Thayer's] theory, they serve as such." Now the night sky, if not what we should call white in the daylight, is yet the lightest thing to be seen on a moonless night, and the deer's tail or the antelope's rump, not being luminous in itself, cannot possibly be any lighter than the sky which is the source of light.¹ White is white, of course, only by virtue of its reflecting all the light that strikes it. It needs only a little knowledge of the significance of colors and a little 'common sense' to see that, but it is easy enough to prove it by experiment too. And Roosevelt's failure to appreciate it is the more astonishing when we are informed that he has experimented with a white towel, only to find that his own views are completely vindicated! In this one point, it seems to me, Roosevelt has shown so complete an ignorance of the most elementary laws of color as to go far towards unfitting him for any discussion of the subject of animal coloration, while showing besides an inability to profit from observation which must vitiate to a great extent the value of the observations which his wide field experience has enabled him to make.

I have before spoken of Roosevelt's dogmatism. Akin to that is his propensity for loose statements such as that on page 184, where he says that the two forms of the red fox, the typical red and the cross fox, are "equally successful in life." If equally successful, why is not the cross fox as common as the red? Since

¹ A little observation will convince most persons that the light on such a night comes from the sky as a whole rather than from the individual stars and planets.

it is not so common, how can he prove it is as successful? He speaks so frequently of one animal being as successful in life as another that one comes to believe that he thinks all animals are equally successful in life!

On page 202, Roosevelt says that Thayer "states that a crouching hare is 'boldly conspicuous' when seen from the position of any 'quadruped pursuer' that would have to look upwards at the hare's tail," and then he goes on to ridicule Thayer and talk about 'preposterous theories' and 'wild absurdities' and use other language which might be appropriate (though impolite) *if Thayer had said anything of the kind*. In reality, however, Roosevelt has made a flagrant misquotation. What Thayer actually said was that the crouching hare was "boldly conspicuous when seen from the position of a mouse or cricket."¹ Now I do not suppose that Roosevelt would really call a mouse, or even a cricket, a 'quadruped pursuer' of the hare! It is obvious that his eagerness to punch Mr. Thayer has led him into a grossly careless misreading of him.

Another ill-considered statement occurs on page 218, where he says, "Birds and mammals living under precisely the same conditions have totally different types of coloration, and display totally different traits and habits when seeking to escape from enemies or to capture prey." Of course, a very little reflection would have shown him that no two species ever live under precisely the same conditions. The very fact of their having different habits in seeking to escape enemies or to capture prey constitutes a difference in the conditions of their lives.

But the most serious of all the misreadings of Thayer that we find in Roosevelt's paper has to do with counter-shading. He entirely overlooks the fact that Thayer's claims for the efficacy of counter-shading concern only those natural backgrounds which the animal resembles in *color*, or, to quote from page 15 of Thayer's book, it is "when seen against a background of color and pattern like its own" that the counter-shaded animal "will be essentially indistinguishable at a short distance." Overlooking this, Roosevelt says, on page 136, "Mr. Thayer insists that the animal escapes observation, not because its colors match its surroundings, or

¹ *Concealing-Coloration in the Animal Kingdom*, motto to Fig. 103, opp. p. 150.

because it sits motionless like a stump, or clod, or some such inanimate thing, but purely because of its shading, which he says is rendered oblitative by the counter-gradation of shades." Then, after adducing considerable evidence as to brown rabbits on green lawns, etc., he says (of woodchucks and pikas) that he never found any difficulty in seeing either when he "could get it on an entirely smooth surface of rock or ground, unless the color of the surface happened to agree absolutely with the color of the coat." Of course not; no one could be expected to, and Mr. Thayer would be the last man to suggest it. Again, on page 189, he tilts at the same windmill. In fact, much of his elaborate argument against counter-shading falls to the ground when we see that it is founded on a misconception.

This matter of color-gradation Roosevelt completely fails to grasp, and his apparent stupidity about it is really amazing. On page 137 he considers it a point against the efficacy of counter-shading that it does not show in a rabbit sitting stern on and that nevertheless the rabbit is no easier to make out in that position than if sideways to the observer. Now of course counter-shading is of avail only where a shadow is cast and in all other positions it is not needed. He falls into the same blunder on page 158 where he says that the female Bob-white on her nest is concealingly colored in spite of not being counter-shaded in that position. Similarly in another place he adduces the absence of counter-shading on the body of a swimming duck; and in his Appendix on protective coloration in *African Game Trails* he remarks on the difficulty that some animal or animals had in making him out as he stood in the forest, even though he was not counter-shaded; though it is hard to see how a man standing upright, or any other upright object with practically no under side except what rested actually on the ground, could possibly be counter-shaded. Does he imagine he might have been still more invisible if he had worn white trousers?

But I think I have said enough to show that Colonel Roosevelt's methods of thought are such that we cannot place implicit confidence in the accuracy of his observation or the soundness of his judgments. If Thayer has been carried away by his enthusiasm, Roosevelt has been carried just as far in the opposite direction

by his prejudices. It is evident, I think, that we cannot accept Roosevelt's conclusions without careful examination, and equally evident that Thayer's testimony, expert though it is, must be weighed in the judicial balance before we can know how much it is worth. And it is for scientific men to make the examination and do the weighing, not for artists nor for hunters. I do not, of course, propose to attempt to settle the question myself. I am simply going to try to draw the lines a little more clearly,—to whistle up a breeze that shall blow away some of the dust and smoke that have settled down over the field, so that the issue may be seen more distinctly.

In the first place, then, what is Mr. Thayer's main contention? It is stated in the Introduction to his book as follows: "The colors, patterns, and appendages of animals are the most perfect imaginable effacers under the very circumstances wherein such effacement would most serve the wearer. For any animal to be seen looking conspicuous means no more than that he is not at those moments looked at under the circumstances for which his concealing-colors are effective."¹ Obviously it is impossible to prove this general statement in particular. No one knows enough of the conditions of the lives of all animals to do so. I think Mr. Thayer is justified, however, in his contention that *if* his conclusions are found to be reasonable in an overwhelming number of cases, it is only fair to give him the benefit of the doubt in those remaining cases where proof is more difficult or even impossible with our present knowledge. Of course, if it can be proved that these hypothetical exceptional cases are *not* cases of concealing coloration, that will settle the question so far as the existence of a universal law is concerned; but it is notoriously hard to prove a negative. I mean by this that Thayer is not called upon to explain the coloration of every single species of bird or mammal. *If* we find his theory true in the main, we can accept the doubtful cases on faith. That is what we have done with the evolutionary theory. It is not necessary to account for the development of every species by natural selection or any other means. We believe in the theory in spite of the inexplicable cases. It must be admitted, however,

¹ *Op. cit.*, p. 9.

that the theory of evolution stands on a somewhat different footing from that of concealing coloration, in that it is in its very nature a universal one, while to account for coloration there may be several theories which are not mutually exclusive. In fact, there seems to be no good *a-priori* reason for *seeking* a universal law for coloration. The old theories, of protective coloration, sexual selection, mimicry, warning colors, directive markings, etc., have long been considered satisfactory enough. If, however, there actually is such a universal law as Thayer asserts, we must come to accept it in the end. It remains to learn the facts.

I need not go into the various methods by which, according to Mr. Thayer, concealment is brought about,—counter-shading, background-picturing, ruptive and secant patterns, masking of eyes, bills and feet, iridescence, appendages, etc. It may be taken for granted that my readers are familiar with the main principles as enunciated by him. Let us turn at once to Colonel Roosevelt's conclusions and see just wherein they differ from Thayer's. In the first place, then, he refuses to accept the theory of natural selection as accounting for such concealing coloration as he admits to exist. He says it is *possible* that the tendency towards concealing coloration is the result of natural selection, but to his mind much more probable that the major part of the tendency is due to the effect of physical surroundings upon all the individuals of a species.¹ This theory has, of course, been held by many, but though moisture and dryness, heat and cold, and diet, all doubtless do have an effect in certain cases, as Mr. Beebe has proved, for instance, in his experiments with birds in captivity, it is in the main a vague and unsatisfactory theory, since it cannot show the method by which such changes are brought about. To most of us, I think, the theory of natural selection seems the most reasonable explanation of most of the facts of evolution. Whether or not Roosevelt's doubts about it are due to a difficulty in reconciling his ideas of advertising coloration with it, he does not state, and we can only conjecture.

Here, then, is one distinct issue,—a belief in natural selection, which, of course, Thayer believes to be universal and Roosevelt

¹ *Revealing and Concealing Coloration in Birds and Mammals*, p. 212 (1).

refuses to accept. Another, but less important, issue is the cognate one of sexual selection, which Roosevelt accepts, though guardedly, but Thayer rejects (implicitly if not explicitly) on the ground that it implies conspicuous coloration, whereas he holds that truly conspicuous coloration does not exist. We will revert to this subject later on.

The next important conclusion of Colonel Roosevelt is that "as regards the majority of birds and mammals the prime factors in securing their safety, are habit (including bodily capacity) if they do not trust to concealment, and habit and cover if they do trust to concealment."¹ "Among these birds and mammals," he says, "the coloration is always a minor, and often a negligible, factor." Now no one doubts the importance of habit, bodily capacity, and cover in protecting animals, but to me it seems an impossibility to settle just what factor is most important. As a matter of fact they are all interwoven, habit depending on coloration, capacity, and cover, coloration depending on cover and habit, etc., etc., so that it seems futile to think of one without the others. To discuss their relative importance would remind one of the discussions in the old-time debating societies, and one might as well argue the question whether the blood or the brain was the more necessary to the life and welfare of man. Of course, when it comes to stating, as Roosevelt does here, that coloration is often a *negligible factor*, that is properly a matter for observation and argument, and that is one of the points upon which Roosevelt's observations and arguments must be weighed.

Roosevelt's next important conclusion — and this, in fact, is the sum and substance of his whole paper so far as it concerns our birds — is that "a large majority, probably at least three fourths or over, of the birds of temperate North America, have coloration patterns which, either in whole or in part, either all the time in both sexes, or all the time in one sex, or some of the time in one sex, are advertising."¹ In support of this conclusion he brings an argument which may prove to be a strong one and well founded. At least it has a certain plausibility and will bear investigation. This is the suggestion that the miscellaneous character

¹ *Op. cit.*, p. 214 (5).

of forest cover is such as to make the detection of an animal of *any* color difficult so long as it remains motionless. (It will be observed that Roosevelt in this gives up the claim that animals under such conditions are actually conspicuous. He admits that they are not, but holds that their coloration has no significance under such circumstances and that therefore it could not have been brought about through natural selection.) One obvious answer is a statement of the well-known fact that the birds of the treetops run quite largely to the brilliant colors, while sea-birds, for instance, show an entirely different style of coloration, largely white and gray and black. As before stated, it is difficult to account satisfactorily for such differences without involving the theory of natural selection. Certainly sexual selection will not explain them, and without one or the other of these methods of selection we should have to fall back upon the vague and unsatisfactory theories of 'harmony in nature' which, if they have any definiteness at all, are really more metaphysical than scientific. But wholly aside from probabilities and theory, what are the facts in the case? Is it true that a bird of any color would be inconspicuous in the forest and that no coloration scheme can make any difference in its conspicuousness? It seems to me that the obvious way to settle this question is by experiment; observation under purely natural conditions being unavailable in this case. Distribute a number of bird-skins, forest birds and sea-birds, impartially in the treetops in some thick wood and see whether there actually is any difference in their conspicuousness or not. It ought not to be a difficult experiment. I am not aware that Mr. Thayer has ever tried it in any of his demonstrations. I hope he will, and I hope that others will.

This suggestion of Roosevelt's,— or rather this pronouncement, for of course he does not offer it as a mere suggestion, though we can accept it as such,— this suggestion that all colors, bright or dull, may be inconspicuous in a forest landscape is to my mind the most important point he makes. Except for this one point, indeed, it seems to me that the value of his paper depends almost entirely on whether we can accept his interpretation of his own

¹ *Op. cit.*, p. 214 (6).

observations. He states, without qualification, that such and such an animal is advertisingly colored. Well, perhaps it is, but the mere statement does not prove it. I have tried to show in an earlier part of this paper why we should be slow to accept all his statements without question, while giving him credit for wide experience and honesty of intention. Let us consider his methods of study as compared with Thayer's, and determine, if we can, which are the more trustworthy. Roosevelt's methods are those of pure observation in the field, with the animals under natural conditions: Thayer uses experiment in addition to observation. Now I should be the last man to depreciate observation. It is the particular form of scientific work that most appeals to my personal tastes. Laboratory methods in the study of living animals have their uses, however, and are more and more being used. By these methods only can we control conditions, so as to isolate the particular class of facts that we are investigating. Rightly safeguarded, this mode of research is invaluable. And it seems to me that in investigating concealing coloration we cannot get along without it, for the simple reason that it is impossible to *observe* anything that is concealed from the eye. When an animal is showing to the best advantage the concealing power of its coloration, that is the very time when we do not see it. I suppose, therefore, that the times when the observer can see this principle in operation in the field are so infrequent, comparatively speaking, that one may get a wholly wrong impression as to the relative conspicuousness of an animal from mere observation and memory. The number of times when a bird, for instance, just fails to elude us ought to be multiplied by a substantial figure in order to include all those individuals which actually do elude us. Of course, no bird of any color can blend into its background all the time. All birds of potentially concealing coloration must sometimes, often in fact, be seen against backgrounds that reveal them. And it is on just these occasions that the observer is most likely to see them. Moreover, the birds that *are* seen against a background that they match, detected by following their flight perhaps, hold the eye as long as the observer watches them and so tend to be regarded as conspicuous. In other words, as Thayer has pointed out, it is the animals that are seen that make their

impression upon us, not the perhaps larger number of individuals of the same species that come within sight of us when we are in their haunts but of which we have no knowledge. Experiments like Thayer's, conducted privately or in conjunction with other persons, are, it seems to me, the most profitable mode of study of the concealing power of coloration, for only by some such means can these inherent difficulties be avoided.

I am aware that there is some distrust of Mr. Thayer's methods of experiment and demonstration, on the ground that in some cases he has not reproduced accurately the natural surroundings of the animals experimented with. It seems to me that such failure to duplicate natural conditions need not be counted against the method itself. Of course, experiments are of little value if we do not know just what the environment of an animal is, but if we do know it and can reproduce it approximately in our home landscape, the method is a perfectly legitimate one. The fact that Mr. Thayer may have been mistaken in regard to the habitat of the Peacock does not vitiate all his experiments, but he and any one else who conducts experiments along this line must, of course, take pains to copy natural conditions faithfully. And we must not leave all the experimenting to Mr. Thayer.

There are other tendencies of the human mind that must be guarded against in prosecuting our studies. One of these I suspect ornithologists are especially subject to. That is the tendency to see what we *know* is there rather than what actually appears to the eye. We are probably more subject to it than most persons because we deal so constantly with what I may call *absolute* color, — color that is such by virtue of pigmentation and structure, not color as seen out of doors in varying lights and subject to the influence of countless neighboring colors. We see a bird's under parts as white, sometimes doubtless because we *know* they are white, and sometimes by the eye's unconsciously making allowance for the effect of shade. In the case of an unrecognized bird observed in the field, we take the greatest pains to get it in the best possible light, and we are constantly translating its apparent colors into terms of the absolute colors that we know or suspect them to represent. That is the only way that we can identify an unfamiliar bird,—without having it in the hand, where no

such translation is necessary. But that is not the way to pursue studies in concealing coloration. We must cultivate the artist's power of seeing only what appears on the surface, if we would see things as the wild creatures see them.

Another tendency that must be guarded against is that of confusing brightness of color with conspicuousness. It is natural, of course, to suppose that a brightly colored bird would be conspicuous, but brightness is by no means synonymous with conspicuousness. There is danger of regarding a bird as conspicuous simply because its colors are unusual and pleasing to the human eye. The real question is whether the bird itself is particularly easily seen in the landscape, and recognized as a bird, by a creature which is merely looking for *any* bird to eat and is not concerned either to wonder at and admire its beauty or to identify it as belonging to a particular species. Of this confusion between unusualness and conspicuousness I have already noted a flagrant case in connection with the Scissor-tailed Flycatcher, whose tail Roosevelt called conspicuous *in shape*. Another very common instance is that of the Blue Jay in a snowy landscape. This bird never looks more beautiful, I think, than against a background of snow, which sets off his blue plumage to perfection. Deceived by his beauty, we are prone to call him a very conspicuous bird, but careful observation will convince any one that he is really not a bit more conspicuous on an even expanse of unshaded or wholly shaded snow than any other dark-colored bird of about the same size, a Robin for instance, while, seen among tree-shadows on the snow, he is actually inconspicuous, as I have noticed on several occasions. The blue of his plumage when lighted by the sun matches the blue of the shadows almost exactly. This is one of the points upon which Mr. Thayer has been most sharply attacked, but any one can prove to himself the relative inconspicuousness of the Blue Jay against snow in the woods if he will try a few experiments and do a little real observation. Take notice, however, that I am merely stating a fact, not drawing any inferences. Whether the fact that the Blue Jay is concealingly colored for winter in a wooded region where snow abounds has any particular significance — whether the coloring has any real protective function other than a purely incidental one — is another matter entirely, and one which I shall not go into at present.

Another element of confusion comes in when we consider recognition-marks or identification-marks. Mr. John T. Nichols has not avoided this confusion of ideas in his discussion of certain recognition-marks in the January 'Auk'. The white stripe down the wing of the Spotted Sandpiper in flight is an excellent field-mark for identification purposes, but I very much doubt if the bird is rendered one whit more conspicuous by it, as a mere bird. Identification-marks have no necessary connection with conspicuousness. In fact, any distinctive marking on a bird may serve as an identification-mark to the ornithologist, and it doubtless may also serve as a recognition-mark for other individuals of the species. The particular class of markings which have come to be called recognition-marks are those which, in the case of birds, are shown prominently in flight, generally on the wings, tail, or rump. They doubtless serve as a means of identifying birds to others of the same species when seen at some distance, the more striking markings operating at the greater distances. But this, though Thayer himself does not appear to have perceived it, does not militate in the slightest against his idea that white markings on wings, rumps, and tails are really concealing rather than revealing in their effect. When I advanced this opinion in conversation with a good friend of mine, he accused me of holding that a bird could be at the same time revealingly colored to its friends and concealingly colored to its enemies. This is not at all what I am saying, however. My point is that these markings are not revealing to either friend or enemy; that is, they do not reveal the bird, they simply identify the species. This, it will be seen, is of little or no importance to the enemy, which is not concerned to know whether the prey it is pursuing belongs to this or that species, but it is of very vital importance to the species that individuals should easily find one another and keep together.

Here, then, are four special tendencies to error to be guarded against in the study of concealing coloration: the tendency to regard any animal actually seen as conspicuous and to take no account of those individuals which escape observation, the tendency to see things as we know or suspect them to be rather than as they really look to us, the tendency to confuse brightness of color with conspicuousness, and the tendency to regard recognition-

marks as of necessity advertising in function. Mr. Thayer, himself, as I have pointed out, in rejecting the theory of recognition-marks fails to see that it is by no means incompatible with his own ideas. There are other cases where it seems to me that his views and those of his opponents are not irreconcilable. One of these is that of a particular class of recognition-marks which under certain conditions are probably advertising and which, indeed, seem to owe their usefulness as recognition-marks to their revealing power. These are the so-called banner-marks of deer, antelopes, rabbits, etc.

Thayer's treatment of these white stern-patches I have thought to be the weakest link in his chain of evidence and argument. His claim that the deer's white flag, for instance, is actually a concealing mark is one of the hardest for us to admit of all the claims he has made. The banner-mark theory, for one thing, was such a neat and satisfactory one and seemed so thoroughly to 'fill the bill' that we dislike to give it up. Any fair-minded and unprejudiced person, however, who will take the trouble to try experiments, or who can see the logic of the situation, must admit that, seen against the sky, in the long run the white must prove to be concealing rather than revealing. The difficulty lies in convincing ourselves that the flag would actually be seen against the sky most of the time rather than against foliage or a hillside. I must confess that I have not yet tried enough experiments to assure myself on this point. What little I have done goes to indicate that Thayer may be right. My idea would be to take from time to time in the woods the point of view of panther or wolf and see whether the interstices in the foliage at the height of a deer's tail at varying distances were numerous enough to spot the landscape pretty thoroughly with glimpses of the sky. It must be borne in mind that it is not necessary to concealment that the white flag should actually relieve against the sky; if it appears among a number of scattered sky spots so that it does not attract attention to itself to the exclusion of other things in the neighborhood, that is quite sufficient. I recommend that this experiment be tried before we indulge in any more ridicule of Mr. Thayer's lack of 'common sense' in this matter.

But if our experiments prove that Thayer is right as to the con-

cealing properties of the deer's white flag, it may still be that this concealment is only incidental, for I suspect that in the deer's case, as in the case of the Spotted Sandpipers before referred to, the white markings may still serve the purpose of directing the deer's companions. The deer's head is carried above the level of his tail or perhaps on a level with the uplifted tail, so that normally the flag would appear to another deer against a very different background from that which the panther or wolf would see it against; that is, of course, when the deer in front is not bounding high in the air, but the flag is thrown up first while the deer is still on the ground and may even be carried that way at a slow canter, and then, too, the following deer is also bounding and so could often catch the white gleam from the deer in front as its tail relieved against the foliage or the ground. I merely throw this out as a suggestion of a possible reconciliation of the theory of directive markings with that of the inherent concealing power of all markings. There is much to be learned about these things, and common sense *plus* experiment and thought will be a safer tutor than unaided common sense. I will add that the last time I saw the deer throw up their white flags, the white, being seen against an evenly clouded sky, was inconspicuous. Of course, it was visible, because this was in the daylight and the deer were in plain sight, but it detracted from, rather than added to, the conspicuousness of the deer.

Sexual selection is another theory that seems to me not at all incompatible with Thayer's main contention. Bright colors, as he shows, or endeavors to show, are not necessarily revealing, but that is not saying that they may not be attractive to the opposite sex. It seems to me that many of the bright and beautiful colors and markings in the plumage of birds may be produced by sexual selection but afterwards acted upon by natural selection. Sexual selection, that is, may supply a short cut to the production of concealing colors when they happen to be bright ones; or, to put it in another way, natural selection may set bounds (I borrow the expression from Roosevelt) to the colorations produced by sexual selection. It seems to me that Mr. Thayer is unnecessarily shy of sexual selection. I cannot see that it tells against his theories at all, and it is a reasonable explanation of the primary, or perhaps I should say the secondary, cause of many forms of coloration.

In the case of those species which make evident displays of brightly colored parts, it is particularly indicated. But colors and markings that are so made use of in the close quarters of courtship are not necessarily conspicuous to enemies or prey at a distance or which if in close proximity are not already aware of the presence of their wearers.

But I shall go no farther at present into this subject of concealing coloration. This paper is not intended as a complete review of Mr. Thayer's book nor even of Colonel Roosevelt's paper. I simply have not been contented to let things stand as Barbour, Phillips, and Roosevelt have left them, because I believe that, in their anxiety lest Thayer's 'heresies' should be too widely accepted, they have failed to do justice to his work. I think it must be admitted, even by those of us who are most appreciative of Mr. Thayer's work, that he has not yet *proved* his main contention. That is, he has not convinced us beyond a reasonable doubt that all coloration of animals has a concealing function and owes its existence to natural selection. I will not say that this is insusceptible of proof, but other ways of accounting for certain colorations seem fairly satisfactory as yet. Nevertheless, Mr. Thayer has shown us several things that we had not seen before, most important of which, doubtless, is the use of counter-shading, though hardly less so is the possibility of bright colors as well as neutral tints being actually concealing in effect. I think that no one can read his book carefully and study his pictures or witness his experiments and demonstrations, no one can experiment for himself out of doors in a leafy and sunlit landscape, without becoming convinced that nature is full of brilliant colors that can be matched only by correspondingly bright hues in the birds. Mr. Thayer's book comes very near being a work of genius, and I submit that scientific men can ill afford to treat it lightly.

When the foregoing paper was read (in a somewhat different form) at a meeting of the Nuttall Ornithological Club, March 18, 1912, one of the members, a leading ornithologist and a Fellow of the A. O. U., stated that he doubted the necessity of protective coloration; that he considered the wariness and intelligence of

animals the only necessary factor in their preservation. My answer to that was that it seemed to me there must be some significance in the fact that there existed in so many undisputed cases so evident a concealing power in coloration. Would this concealment exist if it conferred no benefit upon its possessors? To me it seems only reasonable to assume that concealing coloration has a real reason for being. This is not saying, of course, that all animals are protectively colored. It may be, as is generally believed, that many animals do not need such protection, but the more one studies Mr. Thayer's discoveries in this field of concealing coloration, the more one comes to suspect its approximate universality, and the readier one is to believe that the concealment thus brought about has a protective value that is of benefit to the wearer. As to the relative value of coloration on the one hand and wariness and intelligence on the other, it seems to me, as I have already stated, that the various factors are so interdependent that it is impossible to say which is of the most use.

Another interesting objection to one of Mr. Thayer's theories was brought to light by the testimony of two members as to the unerring aim with which foxes and dogs sprang upon prey that they had located only by scent. This may militate seriously against Mr. Thayer's contention that the final spring, even in the case of animals that habitually hunt by scent, is directed by sight alone. More observation is necessary to settle this interesting point. A failure to establish Mr. Thayer's claim here would go far to weaken his position on the banner-mark question.

BIRDS OBSERVED IN MONTGOMERY COUNTY,
VIRGINIA.

BY ELLISON A. SMYTH, JR.

SINCE Dr. Rives published his 'Catalogue of the Birds of the Virginias' in 1890, I know of no general list for Virginia or any county thereof. My own observations in Montgomery County were commenced in July, 1891. For the past five years, through pressure of college duties, I have been unable to get regularly into the woods during the migrations, so that, while these notes cover a period of twenty-one years, the observations upon which they are based are only comparatively close from 1891 to 1906. Dr. Rives lists 305 species as positively known within the limits of Virginia. In this one county of Montgomery I have authentic personal records of 194 species. It will be noted that in rare and unique occurrences, or where doubt might have existed as to identification, the specimen was secured and is in my collection. Exception to this occurs in one or two cases where identification was absolute and possession of the bird would have been superfluous slaughter. My observations have been made mostly within a radius of eight or ten miles of the town of Blacksburg, and many of my rarer records are from the campus of the Virginia Polytechnic Institute.

The peculiar position of Blacksburg doubtless accounts for many unexpected occurrences of eastern and western forms. The town is about 200 miles west of the Atlantic coast, and is situated in the Alleghany system, in a valley 2170 feet above sea-level. The valley, whose general trend is northeast and southwest, is largely Ordovician limestone. To the west, a low range called Brush Mountain, and to the southeast another range known as Price Mountain, are of the Lower Carboniferous. From Price Mountain, a line of hills runs to the northeast of the town, forming the natural watershed of the region; to the north of these hills the drainage is to Chesapeake Bay, and the Atlantic Ocean through Roanoke River, and to the south and west to the Gulf of Mexico, New River being a tributary of the Ohio.



Estrelata hirsuta, BLACK-CAPPED PETREL.

Taken August 30, 1893, at Blacksburg, Va. Photographed immediately after capture.



2024

While most of the fauna is Carolinian and Alleghanian, a Canadian outcropping occurs, with a few interesting western forms, and this is also well illustrated in the insect life. Only occasionally in the winter is a temperature of zero reached, though on one occasion the record was -15° . The snow fall is comparatively light, there being less than in many nearby localities of lower altitude and farther south.

I have attempted as far as possible to note the earliest and latest occurrence of migrants. Necessarily this is incomplete and is only approximate. Some years I was able to be in the woods at least a part of nearly every day during the migrations; other years sometimes a week or more would elapse between my woodland visits, and I would have to depend on campus observations. The different kinds of ground to be covered also made it impossible to keep impartial records. In the neighborhood are rocky, steep ravines, pine-clad or with rhododendron and kalmia growth on either side; open oak woods; and in the flat broad valley pasture land, grassy or bramble-covered: thus the records of one observer must be very defective, even when extended over a long period.

Several of my records are new to Virginia; one, Franklin's Gull, was, I believe, the first record east of the Mississippi; and another, the Black-capped Petrel, was the third record for the United States. This latter is referred to in Newton's Dictionary of Birds, in a foot-note on page 709.

The large number of ducks — fifteen species — and other water birds observed, is interesting, considering the locality, and the absence of any large body of water or even stream in the immediate vicinity. The connection of New River with the Mississippi seems too remote to explain this, though it is possible that estrays from the Atlantic seaboard might follow up the Roanoke River, and from the Gulf and Mississippi, the New River; and as Blacksburg is almost on the watershed between the two, unusual visitors might thus occur. It is, however, more likely that the lines of migration to and from the northwest have more to do with this.

The town of Blacksburg, and the Virginia Polytechnic Institute are at the head of an extensive, elevated valley, through which several small streams converge, uniting to form a larger, which finally empties into the New River. At intervals, along these

streams, are marshy bottoms, which used to be quite extensive, before they were drained, and which attract snipe in the migrations, and other wading and marsh-loving birds. Below the college campus, an artificial causeway, acting as a dam, allows the flooding during the fall, winter, and early spring, of about two acres of meadow, for an ice-pond, and in spite of much passing of vehicles over the causeway, the pond proves very attractive to water-fowl during the migrations. I have killed fifteen species of ducks, two of grebes, three of gulls, and one tern upon this pond, and have twice seen Canada Geese. Bald Knob Mountain, one of the higher peaks in the State is within fifteen miles of the town; and is remarkable for the extensive lake almost at its summit. The surrounding region is quite wild.

As before indicated, the town is west of the Blue Ridge Mountains, and is near the summit of the Alleghany. It seems to be in the line of the autumnal migration for many warblers, and the spring migration for certain ducks, Nelson's Sparrow and other birds, as the list will more clearly point out.

With these introductory remarks, the list is presented as follows.

1. **Colymbus auritus.** HORNE GREBE.—A rare winter and spring visitor. Only five records, all on the college ice-pond; one in November, three in December and one in April; the latter specimen showing traces of the nuptial plumage.

2. **Podilymbus podiceps.** PIED-BILLED GREBE.—An occasional fall and spring visitor, in late October, late March, and early April. The spring specimens in breeding plumage.

3. **Gavia immer.** LOON.—Accidental. Three November records, all in immature plumage.

4. **Larus franklini.** FRANKLIN'S GULL.—One specimen, a female in fall plumage, was secured near the ice-pond on October 22, 1898 (see Auk, Vol. XIX, p. 74.) This I believe, is the first record of this species east of the Mississippi. The specimen is now in my collection.

5. **Larus delawarensis.** RING-BILLED GULL.—An occasional winter and spring visitor; with one exception, all in adult plumage. I have six records, all on the college ice-pond, by my house; one each for December, January, April and May, and two for March. The May record was of an immature specimen. My house is within fifty yards of the ice-pond, and a spy-glass hangs within easy reach of my study window, so that identifications can easily be made; and if necessary, the gun can be called into service.

6. **Larus philadelphia.** BONAPARTE'S GULL.—One visited the

ice-pond in late March, 1906, another in March, 1908, and a third on April 4, 1911; all adult birds, with white tails.

7. *Sterna forsteri*. FORSTER'S TERN.—Accidental. Two specimens "in the meat" were sent me from Abingdon, Va., where they had been killed on a small fish pond, in August. Both were immature birds.

8. *Sterna hirundo*. COMMON TERN.—One adult male was brought to me alive in June, 1895. It had been wounded, flying about Roanoke river, within five miles of Blacksburg.

9. *Hydrochelidon nigra surinamensis*. BLACK TERN.—On the afternoon of July 5, 1905, a heavy rainstorm or cloudburst, filled completely the bottoms and ponds, particularly the then empty ice-pond. An adult male Black Tern, in perfect plumage, was attracted to the pond, and was secured by me. This is my only record.

10. *Estrelata hasitata*. BLACK-CAPPED PETREL.—(Plate XXIV.) The terrible storm of August, 1893, which wrought such havoc on the South Atlantic coast, brought this ocean waif, in an emaciated condition, into my hands. At the time of record (see Auk, Vol. X, p. 361) it was, I believe, the third specimen of this species recorded for the United States. Newton, in his Dictionary of Birds, page 709, refers to this specimen. It is now in the collection of Dr. Jonathan Dwight, Jr.

11. *Lophodytes cucullatus*. HOODED MERGANSER.—A spring visitor, usually seen in pairs; on one occasion a male and two females were together. I have four records, all from the college ice-pond.

12. *Anas platyrhynchos*. MALLARD.—A regular fall, winter and spring visitor. I have seen as many as fourteen in one fall flock. In the winter and spring they are generally in pairs, or three to four together. Months of record are October, November, December, February, March and April; as early as October 17 and as late as April 23.

13. *Anas rubripes*. BLACK DUCK.—A winter and spring visitor, not abundant; usually in December and March, though I have one record for January 17, and two for May 2, 1903, and May 1, 1911. Largest number seen at any time, a flock of five on December 16, 1902.

14. *Mareca americana*. BALDPATE.—Rare. A pair of males on the ice-pond, April 5, 1911, and three females, with a female Shoveller, on April 8, 1911. This was on a Sunday, and the ducks knew it; they stayed on the pond all day, and became so used to being observed, that I crept to within twenty feet of them, and observed them for some time. When tired of swimming, they came out on the grassy edge of the pond, roamed about awhile, and then huddled together, with their heads under their wings for a nap, just as domestic ducks do. They were gone by Monday morning.

15. *Dafila acuta*. PINTAIL.—Two records for late February and three for March. One male seen with three Mallards on the ice pond, in a snow storm; and again three male Pintails together. Other records are for single birds alone. Only one female, which was secured.

16. *Nettion carolinense*. GREEN-WINGED TEAL.—A pair seen in middle of March, and the drake secured.

17. *Querquedula discors*. BLUE-WINGED TEAL.—A regular spring visitor in March and April. All my records are from the college ice-pond.

18. *Spatula clypeata*. SHOVELLER.—Rare. One male with three females on the ice-pond on February 14, 1911. I secured the male which was in fine plumage. One female with three female Baldpates on the pond the whole of Sunday, April 9, 1911. These, my only records.

19. *Aix sponsa*. WOOD DUCK.—I killed a female that sprang from a ditch to which I was walking, October 19, 1901; and a pair, male and female, were seen at close range as they sprang from a stream in the open field, October 23, 1902.

20. *Marila americana*. REDHEAD.—Three records in March, 1911; one flock of eight birds on the wing; one fine drake, on the ice-pond, observed with the glass, and the next morning, one female, killed on the ice-pond.

21. *Marila valisineria*. CANVAS-BACK.—A magnificent drake of this species and a fine male Ring-neck were killed at one shot on the ice-pond on March 11, 1911. The breast and belly of the Canvas-back were richly suffused with brick-red, as was also the case with a drake Mallard secured in late February here.

22. *Marila affinis*. LESSER SCAUP DUCK.—A regular spring and winter visitor, in November, January, March and April, and one female as late as May 28. The largest flock seen at one time on the ice-pond, contained eighteen birds. One day in January a small flock of six, of both sexes, lit on the ice of the frozen pond, awkwardly walking about with their bodies held very erect. They remained, squatting on the ice for over an hour, when a passer-by scared them.

23. *Marila collaris*. RING-NECKED DUCK. In some numbers during March and April, 1906, as many as five together at one time. Only twice since have they been recorded. I have noticed with these and the Lesser Scaup Duck, that when diving, the tail is always spread, and is deflexed as the head is dipped under water.

24. *Charitonetta albeola*. BUFFLE-HEAD.—One male was killed on the ice-pond May 1, 1898. The only record for this locality.

25. *Eristamatura jamaicensis*. RUDDY DUCK.—One specimen, an adult female, was killed on the ice-pond, November 10, 1910.

26. *Branta canadensis canadensis*. CANADA GOOSE.—In former years, in the early nineties, several flocks could be seen or heard every spring. These have become rarer. My records are mostly in March from the 3rd to the 28th; one for February 22, one in early April, and I have a female in my collection, killed together with two others, on New River, five miles from here, on May 9, 1901. I have seen a flock of thirty-eight fly over my yard, within gun-shot.

27. *Botaurus lentiginosus*. BITTERN.—Doubtless more common than it appears to be; I have only five records; October and November, April and May.

28. *Ardea herodias herodias*. GREAT BLUE HERON.—An infre-

quent visitor, mostly in late April, and one, as late as June. Taken April 17 in fine breeding plumage.

29. **Florida cærulea.** LITTLE BLUE HERON.—Recorded on the strength of several reports that two "White Cranes" (!) were seen at sundry times during August in one year at a near-by pond. Most likely the young of this species, as one that was shot, but which I did not see, was reported to have had the wing feathers "smoky."

30. **Butorides virescens virescens.** GREEN HERON.—A summer resident, breeding in suitable localities. Arrives as early as April 4.

31. **Nycticorax nycticorax naevius.** BLACK-CROWNED NIGHT HERON.—A fine female was secured by me on July 14, 1903. The ovaries appeared to be active.

32. **Rallus elegans.** KING RAIL.—One male brought to me alive, caught by the foot in a musk-rat trap on November 12. Oddly enough, the same day, a Song Sparrow was also caught in another musk-rat trap. Doubtless this rail occurs more frequently.

33. **Rallus virginianus.** VIRGINIA RAIL.—One record in October, and one in May, both birds secured and examined by me. Doubtless more frequent.

34. **Porzana carolina.** SORA.—A regular fall and spring migrant, sometimes abundant in October. Appears as early as September 1. Specimens in full nuptial plumage obtained in early May.

35. **Gallinula galeata.** FLORIDA GALLINULE.—A fine female was shot by me in the top of a maple tree on the College campus on May 1, 1903. This is my only record. I have often thought that a more impossible record could hardly be conceived of; a bird of the salt sea marshes, in the top of a tree, on the summit of the Alleghany Mountains!

36. **Fulica americana.** COOT.—One record for October, and two for April; two obtained and one seen so closely as to make its capture unnecessary.

37. **Philohela minor.** WOODCOCK.—A number of records, singly and in pairs, in April, July, August and October. Not abundant, but occurring often enough to elicit no surprise when one is seen. It may breed, but I have no data.

38. **Gallinago delicata.** WILSON'S SNIBE.—Fairly abundant during the spring migrations, arriving early in March, the average big flight occurring about April 4, and an occasional one seen as late as April 29. Seen also in October and November, though not as numerous as in the spring, and occasionally a lone specimen remains by an open spring during December and even into January. No data as to breeding.

39. **Macrorhamphus griseus griseus.** DOWITCHER.—Two specimens seen and killed on September 5, 1908, after heavy easterly rains, in company with Pectoral and Least Sandpipers, and Killdeers.

40. **Pisobia maculata.** PECTORAL SANDPIPER.—Fairly regular as a spring migrant, in small flocks, from late March through April 8, and occasional in September.

41. *Pisobia minutilla*. LEAST SANDPIPER.— Three seen on August 19, 1903, and eight on September 5, 1908. Specimens obtained on each occasion.

42. *Totanus melanoleucus*. GREATER YELLOW-LEGS.— One September record and four in April. These, in five separate years.

43. *Totanus flavipes*. YELLOW-LEGS.— Frequent, from early March through April 29 and again in September, from the 5th, through 26th. As many as eight seen together in one flock.

44. *Helodromas solitarius solitarius*. SOLITARY SANDPIPER.— A regular visitor in April and May, and again in August and September. In August, at times, anything but solitary; I have seen over ten at one time in a small bog about a quarter of an acre in extent.

45. *Bartramia longicauda*. UPLAND PLOVER.— Summer resident; breeds. Arrives as early as April 6 and here until August 19. Alighting on fences and trees when their breeding places are invaded.

46. *Actitis macularia*. SPOTTED SANDPIPER.— A spring and summer resident. I have found the downy young on the College experiment grounds, attended by their anxious parents. Arrives, April 13; latest seen, August 8.

47. *Aegialitis semipalmata*. SEMIPALMATED PLOVER.— One specimen, seen August 16, 1909 in company with Killdeers. Recognized by its cry and with the telescope.

48. *Oxyechus vociferus*. KILLDEER.— Practically a resident; I have records for every month in the year, and I believe for every day. Scarcest in December, and some years wanting in extreme January weather. Breeds, and mates as early as March 25. Young in the down seen in early May.

49. *Colinus virginianus virginianus*. BOB-WHITE.— Resident; breeds; fairly abundant. Coveys occasionally seen on the college campus.

50. *Bonasa umbellus umbellus*.— RUFFED GROUSE.— "Pheasant." Resident; breeds. Occasional "red-ruffed" males are seen. Noticeably scarcer than twenty years ago.

51. *Meleagris gallopavo silvestris*. WILD TURKEY.— Twenty years ago this was not infrequent in the nearby mountain ravines. It is now rare.

52. *Ectopistes migratorius*. PASSENGER PIGEON.— Whether or not I saw six of these birds in the late fall of 1892 near Blacksburg, I am unwilling now to assert positively, though my notes for that date contain the item. I have shot them in Bath County, Va., when a boy, in 1877. At intervals, during recent years, remarkable tales about their reappearance have gotten afloat. Thus, in December, 1907, the late Chas. K. Worthen wrote, "I have just read that a lot — thousands — of Wild Pigeons had lately settled in the neighborhood of Webster, W. Va. Do you know or can you find out if so?" Upon this, I wrote to Mr. Earle A. Brooks, of that place, who replied that he had had many inquiries, and had heard many positive statements, in answer to his own investigation of the rumors,

from persons who stated positively that they saw flocks of Wild Pigeons, from one to a thousand birds, but "no positive evidence, no specimens, heads, wings or feathers, no statement from any reliable bird student have been received. Many things point to their occurrence in the State last fall." And again this Fall — 1911 — a persistent report reached me that Wild Pigeons in some numbers were seen near Pulaski, Va., not far from here. But that they were very wild, and allowed no one to get within gunshot of them, though many efforts were made to secure some. I failed, however, to "nail" this rumor, and could never find the man who had seen them, though many said they had heard others say that they had seen the birds. I mention these rumors for what they may be worth.

53. *Zenaidura macroura carolinensis*. MOURNING DOVE.— Common resident; breeds.

54. *Cathartes aura septentrionalis*. TURKEY VULTURE.— Resident. In the caves and among the rocks that overhang the New River near here, the "Turkey Buzzard" breeds in some numbers. I have had several sets of eggs from there, and in late May, the 26th, I once saw a nearly fledged young, about the size of an ordinary hen, in one of these caves.

55. *Catharista urubu*. BLACK VULTURE.— Very rare; three records. On October 8 and 9, 1909, there was one Black Vulture with the number of Turkey Vultures that frequent the Experiment Station cattle grounds. The square-cut tail, shorter alar expanse, and quicker flap of the wing, as well as the different tone of black, and the position of the feet in flight, were diagnostic of the bird, in contrast with the Turkey Vultures with which it was flying. On March 12, 1911, I also saw one specimen, and on January 22, 1912, I saw five in company with one Turkey Vulture. In Charleston, S. C., my old home, I used often to note the marked contrast in many respects between these two species.

56. *Circus hudsonius*. MARSH HAWK.— Common in the fall and winter months, and seen as late as April 2. A large proportion of my winter records are for blue males. I have no breeding records.

57. *Accipiter velox*. SHARP-SHINNED HAWK.— Not very abundant. Seen at odd times throughout the year. A pair seen together in early May, evidently male and female, gives color to a report of their breeding in the neighborhood. On one occasion I saw one attacking a Red-headed Woodpecker, which, however, eluded the hawk.

58. *Accipiter cooperi*. COOPER'S HAWK.— Of constant occurrence, though not abundant; breeds. One nest with young found in an old crow's nest.

59. *Astur atricapillus atricapillus*. GOSHAWK.— Very rare. One adult female, of rather small size brought in to me, recently shot, after a cold, windy snowstorm, November 19, 1906. The specimen was in fine plumage.

60. *Buteo borealis borealis*. RED-TAILED HAWK.— A fall and winter resident. My records are for October 30, through November, December, January, February and up to March 31. Most abundant in December and January.

61. *Buteo lineatus lineatus*. RED-SHOULDERED HAWK.—While most abundant during the months of November, December, and February I have records for this hawk for practically every month in the year. Specimens that I have killed had frogs and salamanders, and insect remains — principally grasshoppers — in their stomachs. I have a number of breeding records for this locality.

62. *Buteo platypterus*. BROAD-WINGED HAWK.—Not uncommon from May 7 to September 25; breeds. I saw a flock late in September all flying southwest; they were single, in pairs, and threes, fourteen altogether, and strung out for some distance. Occasionally one would circle for a time, and then resume the line of flight. I have come across a pair in the woods in the late spring, near the tree evidently chosen as a nesting site, from which they valiantly attacked and drove away a Red-shouldered Hawk; I was attracted at this time, and since, by their whining call, which at first I thought was a boy whistling. An incubating female was brought to me on May 18 by a farmer, who said that it had a nest in a large oak tree near his home, and that it was killing his chickens, and that he had shot it just after it had eaten a chicken. I skinned it and opened the stomach in his presence, and showed him, to his astonishment, that its crop contained the remains, easily distinguishable, of a young rat. I visited the nesting place with the intention of obtaining the eggs, but found the nest nearly seventy feet up in an enormous white oak, whose main trunk was fully five feet in diameter, and so gave it up, as I had no climbing irons.

63. *Aquila chrysaetos*. GOLDEN EAGLE.—An irregular fall and winter visitor. Nine specimens recorded, of which I have actually handled six. I have one record for August 15. My other records being in November, December, and February. A female, brought to me in December, measured seven feet, one and one-half inches in extent; this was a young bird. One old male, in fine plumage, I secured on December 1. It had the nape of a deep rich gold, and the tail was fully barred.

64. *Haliaeetus leucocephalus leucocephalus*. BALD EAGLE.—Rare. I have handled two specimens in the dark, immature plumage, secured in January and December, and saw one adult, with white head and tail, soaring over the campus, at a great height.

65. *Falco peregrinus anatum*. DUCK HAWK.—One specimen only, seen in October.

66. *Falco columbarius columbarius*. PIGEON HAWK.—One freshly killed specimen was brought to me in September, the skin of which is now in my collection.

67. *Falco sparverius sparverius*. SPARROW HAWK.—Practically a resident and breeds. Noted every month in the year; they frequent the ivy-covered buildings on the campus, feeding on English Sparrows. The stomach and crop of one individual shot on the campus were densely packed with crickets. A family of fully fledged and flying young seen as late as July 17. I saw one catch a young Robin and perch with it on a telephone pole near one of the buildings, and calmly eat its capture in contempt of the onslaught of several excited adult Robins.

68. *Pandion haliaetus carolinensis*. OSPREY.—Not infrequent in the spring months. I have one record for March, eight for April, in different years, one for May, and one for September. On April 17, 1909, three were in sight at once, circling over the campus.

69. *Aluco pratincola*. BARN OWL.—Occasional. Seven specimens, four males and three females, have come to my hands, in April, May, September and June.

70. *Asio flammeus*. SHORT-EARED OWL.—Occasional in the late fall, in marshy places. I have four records only.

71. *Strix varia varia*. BARRED OWL.—Common resident; breeds.

72. *Otus asio asio*. SCREECH OWL.—Abundant resident; breeds.

73. *Cryptoglaux acadica acadica*.—SAW-WHET OWL.—One specimen reported to me in January last, seen on a window-sill in the early morning. The description was very accurate, and I have no doubt that the bird was this species.

74. *Bubo virginianus virginianus*. GREAT HORNED OWL.—Resident and breeds, though not abundant; have seen partly fledged young as late as April 7.

75. *Coccyzus americanus americanus*. YELLOW-BILLED CUCKOO.—Summer resident; breeds. First arrivals, May 1, usually May 5. Nest and eggs May 19.

76. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—Summer resident; breeds. First arrivals April 26, usually May 5-9. The two species are about equally abundant here.

77. *Ceryle alcyon alcyon*. BELTED KINGFISHER.—My records of the Kingfisher, beginning with March 10, run through April, May, June, and July to August 7. I believe it breeds in suitable localities, though I have no definite record.

78. *Dryobates villosus villosus*. HAIRY WOODPECKER.—A frequent fall and winter visitor, as early as September 10 and as late as February 18.

79. *Dryobates pubescens medianus*. DOWNY WOODPECKER.—Resident; breeds. Earliest nesting record, April 27.

80. *Sphyrapicus varius varius*. YELLOW-BELLIED SAPSUCKER.—Apparently a spring and fall visitor. My spring records are from March 25. to April 17, and again in October. These are the only months for which I have it recorded.

81. *Phloeotomus pileatus abieticola*. NORTHERN PILEATED WOODPECKER.—Resident, though rare now, save in remote mountain ravines. In the early '90's it was much more abundant.

82. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER.—Practically a resident, though winter records vary with the severity of the season. Abundant in spring and summer, mating as early as March 25. My records run through every day of the year. At times this species is a decided nuisance in gardens, ruining the ears of corn in the garden patch.

83. *Centurus carolinus*. RED-BELLIED WOODPECKER.—Apparently only a winter resident. My records start with September 27 and end with February 20.

84. *Colaptes auratus luteus*. NORTHERN FLICKER.— Usually seen every month in the year, though infrequent or wanting in severe winters. During the past winter 1911–1912, which was very severe, several were on the campus throughout December, January, and February. Mates as early as March 25.

85. *Antrostomus vociferus vociferus*. WHIP-POOR-WILL.— Arrives April 13. Last appearance September 28. In this region, very local in its habitat, seldom seen or heard in the immediate neighborhood of Blacksburg, or of the college grounds, but more frequent in adjoining valleys and ravines to the northeast and southwest. I have no breeding records.

86. *Chordeiles virginianus virginianus*. NIGHT-HAWK; BULL-BAT.— Summer resident; breeds; not common save during the late summer and fall flights. First arrival, April 26; begins flocking July 10; big flights throughout September, and last seen October 7.

87. *Chætura pelagica*. CHIMNEY SWIFT.— Summer resident; breeds. Earliest arrival April 12, latest April 28. Average arrival during my twenty years' observation, April 19. Prepares for migration about October 4, when incredible numbers collect in the evenings, whirling round, in decreasing circles, and descend spirally into their chosen chimneys for the night. Latest record, October 20.

88. *Archilochus colubris*. RUBY-THROATED HUMMINGBIRD.— Summer breeding resident. Very abundant at the trumpet blooms of the Tecoma vines on the college buildings in July. Arrives April 19, and latest seen, October 8. One nest, watched from its very beginning, was started May 15, incubation commenced June 5, young nearly full fledged June 20, and feeding on Tecoma blooms June 28.

89. *Tyrannus tyrannus*. KINGBIRD.— Summer breeding resident, abundant. Earliest arrival, April 19, and latest arrival April 26. Seen throughout September into October.

90. *Myiarchus crinitus*. CRESTED FLYCATCHER.— Summer resident, breeds; abundant. Earliest arrival, April 25; latest, April 30. Not seen after August 26.

91. *Sayornis phœbe*. PHŒBE.— Breeds, abundant. Earliest arrival, March 11; latest, March 27. Nest and eggs as late as June 12. At least two broods.

92. *Myiochanes virens*. WOOD PEWEE.— Breeds frequently in the apple trees around my house. Earliest arrival, April 30, last seen September 30.

93. *Empidonax flaviventris*. YELLOW-BELLIED FLYCATCHER.— Arrives April 30, last seen September 23. Common.

94. *Empidonax virescens*. ACADIAN FLYCATCHER.— Throughout the summer. Arrives May 9, latest seen October 11. Common.

95. *Empidonax minimus*. LEAST FLYCATCHER.— Common in orchards throughout the summer. First seen, March 19; latest, September 9.

96. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.— In flocks in open fields and on the campus throughout the fall and winter.

Arrives as early as November 9 and generally leaves in late March, about the 20th. Two seen as late as April 14, in 1905. I have collected specimens at various times from their first arrival and on, towards the end of their stay, throughout a number of years, and all have been the smaller and paler form, *pratricula*.

97. *Cyanocitta cristata cristata*. BLUE JAY.—Like the Whip-poor-will, rarely seen in the valley in which Blacksburg lies, though common in a valley to the southwest, and in another to the northeast where the Roanoke River flows. I have eight records only, for the college campus, in April, May, August and October.

98. *Corvus corax principalis*. NORTHERN RAVEN.—I saw a pair of Ravens on the summit of Whitetop Mt. in Washington Co., Va., in September; this is the highest mountain in the State, and reaches the Balsam zone. On May 9, 1903, while collecting in a ravine near Blacksburg, I heard a hoarse, crow-like 'quonk,' and looking up, saw a Raven pursued by two Crows. Here there was no question of identity, as the size, shape, and cry of the Raven were in marked contrast with the characters of the noisy, smaller, aggressive Crows.

99. *Corvus brachyrhynchos brachyrhynchos*. CROW.—In the sense that Crows are always here, I suppose this bird can be called a resident, though I am unable to say whether the breeding birds go south in winter, and are replaced by migrating northern birds, as is the case with Robins. I think the same birds are here throughout the year. They pair in late March and are building by April 9.

100. *Dolichonyx oryzivorus*. BOBOLINK; RICE-BIRD.—A spring and fall migrant; very constant in date of spring arrival, coming as early as April 25, or at the latest, April 29, and remaining until May 14. The males arrive first and are in song throughout their short stay; in some years the females are as abundant, though usually the small flocks contain nearly all males. They are seen all over the open campus, and are usually known as 'May-birds.' In the fall, they arrive, in the Rice-bird plumage, about September 9 and are then very fat, and frequently in some numbers, and there is a succession of small flocks until September 22, when all depart. During this period, the 'clink' of passing birds can be heard throughout the night.

101. *Molothrus ater ater*. COWBIRD.—I have noted flocks of this species, of mixed sexes, from January 19 through April 23; most common throughout March.

102. *Agelaius phoeniceus phoeniceus*. RED-WINGED BLACKBIRD.—February 22 seems picked out as the usual date for the arrival of the Red-wing, in small flocks of males, the females arriving later, and apparently not abundant until April, when mating begins. First nests observed May 13; eggs on May 19, and young flying by June 10.

103. *Sturnella magna magna*. MEADOWLARK.—Resident. Very tame on the campus, where they are protected and are found in the hardest winter weather, seeking open places over the pipe and sewer lines where the

ground is thawed. I have seen fledged young as early as May 13; have found nests with eggs throughout May, and one nest with fresh eggs as late as July 12. I think two broods are usual, and possibly three occasionally.

104. *Icterus spurius*. ORCHARD ORIOLE.—Breeds; arriving as early as April 26, and is building by May 16. Very constant in the date of arrival, April 26 to 29 being the range of variation.

105. *Icterus galbula*. BALTIMORE ORIOLE.—Breeds. Range of first arrivals is from April 23 to April 30. Latest seen, August 22. Nest with eggs, by May 16. They frequent the potato patches with the fledged young and feed freely on potato beetles.

106. *Euphagus carolinus*. RUSTY BLACKBIRD.—A spring and fall migrant. Flocks of rusty individuals arrive about October 19 and are here until late in November. I have one record of one individual for December 31. A few begin to return by February 27. By March 8 full plumaged birds are here and remain until March 19 when they pass on.

107. *Quiscalus quiscula quiscula*. PURPLE GRACKLE.—Single specimens of the Crow Blackbird occasionally occur throughout the winter months; thus I have one record for December 29, 1904, one for January 17, 1907, and one for February 18, 1906. The earliest advent noted, in small flocks, is February 20; by March 8 the returning flocks are increasing in numbers. Earliest eggs noted are for May 20. By July 4, those breeding near each other begin to flock, young and old going out in the morning to feed in flocks, and returning together at sunset. By mid-October flocking for migration is evident, numbers leaving and being replaced by more northern flocks, which stop over for a few days in their flight, until by October 27 all are gone. About this time and later they are replaced for a few days by small flocks of the Bronzed Grackle.

108. *Quiscalus quiscula seneus*. BRONZED GRACKLE.—In small flocks from October 18 until November 20. One seen January 20, and a doubtful record was given me for March 10.

109. *Carpodacus purpureus purpureus*. PURPLE FINCH.—A winter and spring migrant. From February 15 to May 1. Most abundant in March and April. Seen also early in November.

110. *Loxia curvirostra minor*. CROSSBILL.—Saw one male on a fir tree on the campus, on January 16. I was attracted by its note, and got easily within thirty feet of it and watched it for some time. The odd occurrence of this species in the summer months in unlikely southern localities has been noted: by Wayne, at Yemassee, S. C., for two or three years; and by Wirt Robinson, in Nelson Co., Va., in July. So it was no surprise to me to find a flock in the town limits of Blacksburg on June 12, 1909, which remained for several days, and specimens therefrom were brought me for identification.

111. *Astragalinus tristis tristis*. GOLDFINCH.—A roving resident. Here every month in the year. Plumage of the males changing in late April. A late breeder; eggs as late as August.

112. *Spinus pinus*. PINE SISKIN.—Occasional in the winter. In 1908, a large flock was here continually from December 26 until May 4, 1909.

113. *Poocetes gramineus gramineus*. VESPER SPARROW.— Summer resident, breeds. Earliest arrival, March 17; last seen, November 2. Abundant.

114. *Passerculus sandwichensis savanna*. SAVANNAH SPARROW.— Winter resident, from October 5 to April 8. Abundant.

115. *Ammodramus savannarum australis*. GRASSHOPPER SPARROW.— Summer resident; breeds. A late spring migrant, arriving in late May or early June, and here until October 10. Abundant.

116. *Passerherbulus nelsoni nelsoni*. NELSON'S SPARROW.— A fine female, in fresh plumage was brought into the house by my cat on May 23, 1908. (See Auk, Vol. XXV, p. 475.) Possibly occurs regularly at or about this date, but apt to be overlooked or mistaken in the grass for the Grasshopper Sparrow.

117. *Zonotrichia leucophrys leucophrys*. WHITE-CROWNED SPARROW.— Specimens in breeding plumage, mostly males, arrive May 6 and are gone by May 9. Again, in the fall, brown-headed individuals, in some numbers, October 13–22. Very constant in date, and seldom here over three days.

118. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.— Abundant in April and October. Earliest fall arrival, October 9 and gone by November 12. In Spring, from April 6 to May 8.

119. *Spizella monticola monticola*. TREE SPARROW.— An abundant winter resident, flocking, twittering and singing in company with the Juncos, from November 22 to March 10.

120. *Spizella passerina passerina*. CHIPPING SPARROW.— An abundant summer breeder, in evidence from March 11 to October 22, building by May 2.

121. *Spizella pusilla pusilla*. FIELD SPARROW.— Abundant, arriving Mar. 13 and here until November 5. Eggs by May 2.

122. *Junco hyemalis hyemalis*. SNOWBIRD; JUNCO. Though I have examined many in early fall and throughout the season, I have found only the typical northern form; yet I feel sure that *carolinensis* must occur. Arrives October 12 and here in abundance until April 22 singing during the latter part of its stay.

123. *Junco hyemalis carolinensis*. CAROLINA JUNCO. Not identified. Reported to breed on the top of White-top Mountain, in Washington Co., Va., where I have seen Juncos in August.

124. *Peucaea aestivalis bachmani*. BACHMAN'S SPARROW.— Accidental. One specimen, May 2, 1906. (See Auk, Vol. XXIII, p. 341.)

125. *Melospiza melodia melodia*. SONG SPARROW.— Resident. Singing on cold, snowy, winter days, with a hope of Spring in its song. Building April 16, and eggs as late as July 13. Two-, and possibly three-brooded.

126. *Melospiza lincolni lincolni*. LINCOLN'S SPARROW.— Only three specimens seen, and all obtained, two in early May, and one on September 28.

127. *Melospiza georgiana*. SWAMP SPARROW.— Apparently only a winter resident. Observed from October 5 to March 11. Abundant along banks of streams and in marshy places.

128. *Passerella iliaca iliaca*. FOX SPARROW.— Not abundant. Observed in small numbers or singly, from October 15 to November 24, and again from February 25 to March 17.

129. *Pipilo erythrophthalmus erythrophthalmus*. TOWHEE.— An abundant breeding summer resident. Arrives April 9, males usually preceding the females. Latest seen, October 24. In moulting plumage throughout September.

130. *Cardinalis cardinalis cardinalis*. CARDINAL.— Resident. Not abundant. Several pairs nest on the campus and are here all winter and throughout the year. Eggs as early as April 29. Fledged young flying with old birds as late as July 20.

131. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBEEK.— A rare spring and fall migrant. Two males killed April 29 and one seen May 3, a female on September 19 and a young male September 23, complete my record for this immediate locality. I know it to breed in Taylor's Valley, near White-top Mountain.

132. *Passerina cyanea*. INDIGO BUNTING.— An abundant summer resident and a late breeder. Arrives April 26 and last seen October 12.

133. *Piranga erythromelas*. SCARLET Tanager.— Common in the spring migration. I doubt if it breeds here. Arrives as early as April 29 and incidentally seen through April and as late as May 16. On several occasions in May, I have seen a number together; thus on May 16, 1907, five males in the top of one oak tree; on May 9, 1908, three males together, and on May 12, 1903, two males and one female together. Red males pass south July 4 to 17¹ and females and young from August 22 to September 23.

134. *Progne subis subis*. PURPLE MARTIN.— A constant but not abundant summer resident. Breeds in the Martin boxes set out for it. Arrives March 22, though more often later, most of my "First arrivals" being early in April. Nesting by June 5. Last seen September 1.

135. *Petrochelidon lunifrons lunifrons*. CLIFF SWALLOW.— An abundant summer breeding resident. Arrives May 7, and flocks for departure in late July.

136. *Hirundo erythrogastra*. BARN SWALLOW.— Abundant summer breeding resident, sometimes arriving too early for safety, and killed by early April freezes. First arrival noted April 6. Flocks by July 20 and gone by September 5.

137. *Iridoprocne bicolor*. TREE SWALLOW.— A spring migrant. All of my records are for April, from the 5th to the 28th. Not seen at other times.

138. *Riparia riparia*. BANK SWALLOW.— Seen from April 1 to August 11. Whether I have ever mistaken on the wing the Rough-winged Swal-

¹ It would seem more probable that they pass into the green plumage at this date. E.D.

low for this species here, I do not know; all the specimens I have killed at various times have been Bank Swallows.

139. *Bombycilla cedrorum*. CEDAR WAXWING.— A summer breeding resident. In flocks from March 5 until May, when pairing begins. A pair built in an apple tree within a few feet of my house, and were so quiet that I did not know of the nest until the young were nearly fledged. Flocks again by September, and seen until October 27.

140. *Lanius ludovicianus ludovicianus*. LOGGERHEAD SHRIKE.— Occurs sparingly throughout the year, commoner in fall and winter. I have no breeding records. The honey-locust trees on the campus often contain shrews and small meadow mice impaled on their thorns. On one occasion, I saw a Shrike catch a Junco, this was in February; and one cold December day I saw one eating the dried remains of impaled grasshoppers and caterpillars on a thorn bush.

141. *Vireosylva olivacea*. RED-EYED VIREO.— An abundant summer breeding resident, arriving by April 19, and here until September 16.

142. *Vireosylva gilva gilva*. WARBLING VIREO.— Breeds in the orchard around my house, where its song is heard throughout the spring and summer. Arrives April 23 and latest seen September 27. Common.

143. *Lanivireo solitarius solitarius*. BLUE-HEADED VIREO.— Apparently only the typical species occurs here; in the spring, from April to May 2. Rare.

144. *Lanivireo flavifrons*. YELLOW-THROATED VIREO.— A woodland summer resident. First arrival noted April 14; last seen August 20, though it probably occurs later. Common.

145. *Mniotilta varia*. BLACK AND WHITE WARBLER.— Abundant throughout the spring and summer. Earliest seen April 10, and latest September 5. Families of old and young in early July.

146. *Helminthos vermivorus*. WORM-EATING WARBLER.— Arrives April 28, wanting after July 23. One pair found nesting on June 2, and eggs hatching on the 5th, and the young flying by June 23. Common.

147. *Vermivora chrysoptera*. GOLDEN-WINGED WARBLER.— Not common, but breeds; one nest with young, found June 5. Arrives May 5.

148. *Vermivora celata celata*. ORANGE-CROWNED WARBLER.— One specimen obtained October 2.

149. *Vermivora peregrina*. TENNESSEE WARBLER.— A migrant, abundant in the fall from September 16 to October 10. Apparently wanting in the spring migrations, probably taking some other line for the vernal flight.

150. *Compsothlypis americana usneæ*. PARULA WARBLER.— An abundant breeding summer resident, building its lichen-suspended nests in the Usnea on crab-apple trees and Crataegus. Full plumaged males here by April 13. One pair commenced building nest April 30, finished by May 8, incubation was in progress May 13 when the nest was destroyed by some boys. Flying young are abundant by mid-July.

151. *Dendroica tigrina*. CAPE MAY WARBLER.— A fall and spring

migrant. Fine plumaged males taken in late September and young are passing until October 26. One adult male in song on the campus on May 6; this is my only spring record.

152. *Dendroica aestiva aestiva*. YELLOW WARBLER.—An abundant summer breeding resident. Arrives April 13. Building by May 14 in apple trees.

153. *Dendroica caerulescens caerulescens*. BLACK-THROATED BLUE WARBLER.—Common in the spring and fall migrations; from April 20 to May 9 and from September 16 to October 9.

154. *Dendroica coronata*. MYRTLE WARBLER.—Common in low shrubbery, and careless of approach throughout October; frequenting tree tops and wary from April 18 to May 9, during which period it is often in song, and in nearly perfect vernal plumage. One record for March 14.

155. *Dendroica magnolia*. MAGNOLIA WARBLER.—A common spring and abundant fall migrant; May 8 to 13 and September 10 to October 9; the fall specimens mostly immature.

156. *Dendroica cerulea*. CERULEAN WARBLER.—A very rare spring warbler, only two specimens ever seen here by me; May 2, 1891, and May 1, 1893, the latter secured.

157. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—An uncommon spring migrant, a few pairs stopping to breed. Two nests with eggs, May 23, 1909, are my only breeding records. Very abundant in the fall migrations, from July 18 to September 10. The earlier fall records being possibly locally bred birds.

158. *Dendroica striata*. BLACK-POLL WARBLER.—Only two spring records, May 16, 1903, and May 15, 1907, both full plumaged males. Very abundant in the fall from September 23 to October 9.

159. *Dendroica fusca*. BLACKBURNIAN WARBLER.—Another rare spring migrant, but abundant in the fall. I saw and heard a full plumaged male in song on the campus, May 14, 1910, and one other, May 2, 1892. Common throughout September in immature plumage.

160. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—A common spring and abundant fall migrant. Found during the latter part of April, in breeding plumage, and from July 20 to October 6. May possibly breed, as the July records are all immature birds.

161. *Dendroica vigosii*. PINE WARBLER.—Very rare here; two specimens obtained September 14.

162. *Dendroica palmarum hypochrysea*. YELLOW PALM WARBLER.—Two adults secured May 3; abundant in the fall from September 30 to October 22.

163. *Dendroica discolor*. PRAIRIE WARBLER.—Only two records, May 2 and September 3, latter a young bird.

164. *Seiurus aurocapillus*. OVEN-BIRD.—An abundant breeding summer resident. Earliest arrival April 26, and latest seen October 12. Nest with fledglings June 9.

165. *Seiurus motacilla*. LOUISIANA WATER-THRUSH.—This, the

only form seen here, breeds along water courses in wooded ravines. Arrives April 9; latest record October 10. I have killed and closely watched many, to see if the slender-billed *noveboracensis* occurred, but have found every specimen to be the large-billed form. Near Charleston, S. C., many records that I have are all of *noveboracensis*.

166. *Geothlypis trichas trichas*. MARYLAND YELLOW-THROAT.—A summer resident, breeding; common. Arrives May 8; not seen after September 27.

167. *Icteria virens virens*. YELLOW-BREASTED CHAT.—Abundant; breeds. Arrives April 29. Seen in its 'dropping song' May 3; latest noted September 16, a female.

168. *Wilsonia citrina*. HOODED WARBLER.—Apparently rare in the spring, May 12 the earliest record. Seen again July 30 and common in August and up to September 15.

169. *Wilsonia pusilla pusilla*. WILSON'S WARBLER.—Occasional. Two spring records, May 12, 1906, and May 15, 1907; and three records for September 20 and 28, 1892, and September 10, 1910.

170. *Wilsonia canadensis*. CANADA WARBLER.—One specimen only, August 15.

171. *Setophaga ruticilla*. REDSTART.—A summer resident, arrives April 30 and remains until September 30.

172. *Anthus rubescens*. PIPIT.—A winter visitor. In flocks on the bare fields from October 19 to April 2. In severe winters, not seen in January or February.

173. *Mimus polyglottos polyglottos*. MOCKINGBIRD.—An irregular and uncommon visitor or resident, I hardly know which to say. For the past three years, two have been constant residents on the campus, and are reported to have bred. Before this, my records, oddly enough, are for the late fall and winter months only.

174. *Dumetella carolinensis*. CATBIRD.—Summer breeding resident; abundant. Arrives April 26; latest seen October 10. Building by May 12.

175. *Toxostoma rufum*. BROWN THRASHER.—An abundant summer resident, from April 10 to October 9. Earliest nest and eggs, June 3.

176. *Thryothorus ludovicianus ludovicianus*. CAROLINA WREN.—Resident; its bright, voluble song heard throughout the winter. Full fledged young, May 16.

177. *Thryomanes bewicki bewicki*. BEWICK'S WREN.—Abundant; a breeding summer resident, nesting in holes in fence rails, on beams under houses, in barns and corn cribs, and other suitable places. Arrives March 17, seen and heard until September 30; one stray specimen January 22, 1903. Commences to build by March 28, nesting all through April, and nest and eggs found as late as May 11.

178. *Troglodytes aëdon aëdon*. HOUSE WREN.—A common summer resident, building in holes in the brick walls of the college buildings. Seen from April 24 to September 23.

179. *Nannus hiemalis hiemalis*. WINTER WREN.—Occasionally seen. Some half dozen records from October 9 to November 16.

180. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—One specimen secured, October 24. Suitable localities not very numerous in this mountain land.

181. *Telmatoodytes palustris palustris*. LONG-BILLED MARSH WREN.—Frequent, from April 28 to October 30. I have found one nest, but do not think it is a regular breeder, owing, perhaps, to the scarcity of suitable marshy places.

182. *Certhia familiaris americana*. BROWN CREEPER.—It may be my fault that I have seen this inconspicuous little bird only from April 10 to May 1, and from October 10 to February 18, apparently more common in the fall and winter, when the trees are bare. On one occasion, clad in khaki I was standing motionless watching a Creeper on an oak tree near by, when the bird flew downward and lit on my leggings, and scrambled nearly up to my waist, when it took fright and flew away.

183. *Sitta carolinensis carolinensis*. WHITE-BREADED NUTHATCH.—Resident, and fairly abundant.

184. *Sitta canadensis*. RED-BREADED NUTHATCH.—I secured two on August 12, 1899, which seemed to be young, just fledged. One other obtained September 1.

185. *Penthestes carolinensis carolinensis*. CAROLINA CHICKADEE.—Resident. Common.

186. *Baeolophus bicolor*. TUFTED TITMOUSE.—Resident, and, with the former species, coming around dwellings in the winter; one specimen flying through an open window into a room. Breeds in holes in trees, building April 13, nesting April 28, and with young May 30.

187. *Regulus satrapa satrapa*. GOLDEN-CROWNED KINGLET.—March 28 to April 15, and October 15 to December 29. Two records in January, 10 and 30, 1902. Abundant during the migrations.

188. *Regulus calendula calendula*. RUBY-CROWNED KINGLET.—One record, January 30, 1902, in company with *R. satrapa satrapa*. Abundant from April 10 to 23, its wonderful song then heard occasionally. In the fall, in great numbers from September 27 to November 22.

189. *Polioptila caerulea caerulea*. BLUE-GRAY GNATCATCHER.—Frequent, from April 17 to May 9. One record July 18, and two for September 2 and 20.

190. *Hylocichla mustelina*. WOOD THRUSH.—An abundant summer resident, from April 26 to September 30.

191. *Hylocichla fuscescens fuscescens*. VEERY.—A spring migrant, from April 30 to May 6. Common.

192. *Hylocichla ustulata swainsoni*. OLIVE-BACKED THRUSH.—To distinguish with certainty this species from the Hermit Thrush, and others closely related, when sitting, flying or hopping in dense and dark underbrush, without committing murder, is not given to all ornithologists. I have only two positive records of the Olive-back, May 9 and 13. One

bird obtained and the other identified with certainty. At other times I have been unwilling to say positively as to the species, and have killed too many Hermits to make sure, and have latterly preferred to remain in doubt, rather than kill.

193. *Hylocichia guttata pallasii*. HERMIT THRUSH.—Common from March 6 to May 8 and from October 12 to November 2.

194. *Planesticus migratorius migratorius*. ROBIN.—I have records of individuals and flocks for every month in the year. About September 18 the breeding birds start south, and are succeeded throughout the fall and winter by more northern birds, the most northern probably making this region the average limit of their southern migration, going a little south from here in severe winter weather and returning with every mild change. This past winter (1912), a very severe one, numbers of Robins have been on the campus throughout January and February. Spring migrants begin to return by February 22, waves of migration pass through in March; by April 11 building is going on. There are, I think, at least three broods, certainly two. In 1900 I found partially fledged and fluttering young on April 6.

195. *Sialia sialis sialis*. BLUEBIRD.—Practically resident and breeding about the houses in suitable holes; nest building as early as March 24. In cold weather, feeding on the berries of ampelopsis, on the piazza of my house. Some times absent for a period during very severe winter weather; though some winters, here through the whole season.

SUMMARY.

Residents.

Killdeer.	Red-headed Woodpecker.
Bob-white.	Flicker.
Ruffed Grouse.	Blue Jay.
Turkey.	Crow.
Mourning Dove.	Meadowlark.
Turkey Vulture.	Goldfinch.
Cooper's Hawk.	Cardinal.
Red-shouldered Hawk.	Mockingbird.
Sparrow Hawk.	Carolina Wren.
Barred Owl.	White-breasted Nuthatch.
Screech Owl.	Carolina Chickadee.
Great Horned Owl.	Tufted Titmouse.
Downy Woodpecker.	Robin (see note).
Pileated Woodpecker,	Bluebird.

Summer Residents.

Green Heron.	Towhee.
Woodcock.	Indigo Bunting.
Upland Plover.	Purple Martin.
Spotted Sandpiper.	Cliff Swallow.
Sharp-shinned Hawk.	Barn Swallow.
Broad-winged Hawk.	Bank Swallow.
Yellow-billed Cuckoo.	Cedar Waxwing.
Black-billed Cuckoo.	Red-eyed Vireo.
Kingfisher.	Warbling Vireo.
Whip-poor-will.	Yellow-throated Vireo.
Nighthawk.	Black and White Warbler.
Chimney Swift.	Worm-eating Warbler.
Ruby-throated Hummingbird.	Golden-winged Warbler.
Kingbird.	Parula Warbler.
Crested Flycatcher.	Yellow Warbler.
Phoebe.	Chestnut-sided Warbler.
Wood Pewee.	Oven-bird.
Yellow-bellied Flycatcher.	Louisiana Water-Thrush.
Acadian Flycatcher.	Maryland Yellow-throat.
Least Flycatcher.	Yellow-breasted Chat.
Red-winged Blackbird.	Redstart.
Orchard Oriole.	Catbird.
Baltimore Oriole.	Brown Thrasher.
Purple Grackle.	Bewick's Wren.
Vesper Sparrow.	House Wren.
Grasshopper Sparrow.	Long-billed Marsh Wren.
Chipping Sparrow.	Wood Thrush.
Field Sparrow.	

Winter Residents.

Red-tailed Hawk.	Savannah Sparrow.
Hairy Woodpecker.	Tree Sparrow.
Red-bellied Woodpecker.	Junco.
Prairie Horned Lark.	Swamp Sparrow.

Spring Visitors.

Ring-billed Gull.	Canada Goose.
Bonaparte's Gull.	Great Blue Heron.
Hooded Merganser.	Osprey.
Baldpate.	Nelson's Sparrow.
Green-winged Teal.	Tree Swallow.
Blue-winged Teal.	Blue-headed Vireo.
Redhead.	Cerulean Warbler.
Canvas-back.	Veery.
Ring-necked Duck.	Olive-backed Thrush.
Buffle-head.	

Fall Visitors.

Wood Duck.	Bronzed Grackle.
Ruddy Duck.	Tennessee Warbler.
King Rail.	Pine Warbler.
Least Sandpiper.	Winter Wren.
Short-eared Owl.	Short-billed Marsh Wren.

Late Winter and Spring Visitors.

Black Duck.	Cowbird.
Pintail.	Pine Siskin.
Shoveller.	

Spring and Fall Visitors.

Pied-billed Grebe.	Rose-breasted Grosbeak.
Bittern.	Scarlet Tanager.
Virginia Rail.	Cape May Warbler.
Sora Rail.	Black-throated Blue Warbler.
Coot.	Myrtle Warbler.
Wilson's Snipe.	Magnolia Warbler.
Pectoral Sandpiper.	Black-poll Warbler.
Greater Yellow-legs.	Blackburnian Warbler.
Yellow-legs.	Black-throated Green Warbler.
Solitary Sandpiper.	Yellow Palm Warbler.
Barn Owl.	Prairie Warbler.
Sapsucker.	Hooded Warbler.
Bobolink.	Wilson's Warbler.
Rusty Blackbird.	Golden-crowned Kinglet.
White-crowned Sparrow.	Ruby-crowned Kinglet.
White-throated Sparrow.	Blue-gray Gnatcatcher.
Lincoln's Sparrow.	Hermit Thrush.
Fox Sparrow.	

Fall, Winter and Spring Visitors.

Horned Grebe.	Purple Finch.
Mallard.	Pipit.
Lesser Scaup Duck.	Brown Creeper.
Marsh Hawk.	

Fall and Winter Visitors.

Golden Eagle.	Loggerhead Shrike.
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Summer Visitors.

Little Blue Heron.	Canada Warbler.
Black-crowned Night Heron.	Red-breasted Nuthatch.

Accidental.

Loon.	Goshawk.
Franklin's Gull.	Bald Eagle.
Forster's Tern.	Duck Hawk.
Common Tern.	Pigeon Hawk.
Black Tern.	Saw-whet Owl.
Black-capped Petrel.	Raven.
Florida Gallinule.	Crossbill.
Dowitcher.	Bachman's Sparrow.
Semipalmated Plover.	Orange-crowned Warbler.
Black Vulture.	

NUMBER OF SPECIES — RECAPITULATION.

Residents	28
Summer Residents	55
Winter Residents	8
Spring Visitors	19
Late Winter and Spring Visitors	5
Fall Visitors	10
Spring and Fall Visitors	35
Fall, Winter and Spring Visitors	7
Fall and Winter Visitors	2
Summer Visitors	4
Accidental	19
Unclassified or Hypothetical	3

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It will be noted that I have not included in this list the omnipresent English Sparrow. This does not imply that we are favored above surrounding regions. My division of seasons is not exactly that usually given, but I thought this more minute division would give more exactly the times of appearance of visitors.

GENERAL NOTES.

Laughing Gulls in Plymouth County, Mass.— While spending the first part of August at Manomet Point, Mass., I was surprised to note the abundance of *Larus atricilla* off the point. During calm weather I saw every day a hundred or more in the vicinity of the point, generally keeping pretty well together. On August 13 I noted about thirty on Fresh Pond, a large body of water situated about a half a mile from the shore. They were characteristically noisy both on the water and when circling about the pond. About sixty per cent of the birds seen were in juvenal plumage.

This is the first summer I have seen this species in Plymouth Co., though Mr. Barret has recorded it. (Auk, Vol. 29, Jan., 1912, p. 99).— W. SPRAGUE BROOKS, *Milton, Mass.*

Brown Pelican on Pamlico Sound and at Durham, N. C.— An unusual spring visitation of Brown Pelicans was observed at Ocracoke, N. C., this season. The writer, with his assistant, Mr. T. W. Adickes, spent the week of May 20–25 at this point and, covering this period, Pelicans were daily in evidence. The center of their abundance seemed to be on the shoals and ‘lumps’ in and opposite the Inlet, where a flock of something over a hundred made their headquarters. Two specimens were collected on May 24, both of which proved to be males, with the sexual organs but little developed. One of them was in quite immature plumage, the other having the white head of the adult.

The two boatmen who waited on us while there — one of them having been game warden in the Cape Hatteras region for several years, and quite familiar with the bird life of the locality — reported another flock of about a hundred seen on the lumps between Hatteras and Ocracoke on their trip to the latter place on May 20.

This species is not uncommon at times on lower Pamlico Sound during the late summer, but this is our first record of the bird as a common spring visitant to the region.

On May 29 a female, approaching the adult stage of plumage, was collected on a small pond close to the large West Durham cotton mill. It was received at the museum in the flesh. The ovaries showed no indication of its being a breeding bird.— H. H. BRIMLEY, *Raleigh, N. C.*

The Man-o'-war-bird (*Fregata aquila*) on the Coast of Georgia.— Mr. J. J. Sutton of Ridgeville, Georgia, recently sent to the Biological Survey a photograph of a specimen of *Fregata aquila* captured last June near the Sapelo Lighthouse in McIntosh County on the coast of Georgia, a few miles northeast of Darien. Mr. Sutton furnishes the following account of the capture of the specimen:

Mr. Wm. G. Cromley, a taxidermist, while on a visit to his brother,

keeper of the Sapelo Lighthouse, on June 8, 1912, saw the bird coming in from the sea, circle about the lighthouse several times, and then proceed due west. After two or three minutes it changed its course and started out to sea again. As it passed the lighthouse Mr. Cromley heard the report of a gun and saw the bird come down. He secured it, mounted it, and the specimen is now in his possession.

The Man-o'-War-bird was apparently first recorded in the list of Georgia birds more than sixty years ago. Through the kindness of Mr. Arthur H. Howell, my attention has been called to White's list of the birds of the State, which appeared in a little known work published at Savannah in 1849.¹ The appendix contains a nominal list of 273 birds found in the State, including the present species, but without comment or reference to any records. The present specimen seems to be the first definite record for the State.

As is well known, *Fregata aquila* occasionally strays northward some distance along both coasts and in the interior. On the Atlantic Coast Audubon recorded the fact as early as 1835 that it 'rarely travels farther eastward than the Bay of Charleston in South Carolina' (Ornith. Biog., III, p. 495), and Grinnell in 1875 intimated that it had been found as far north as Long Island.² Beside the Georgia bird at least nine other specimens have been reported from points north of Florida: namely, in 1859, 1871 (?), 1876, 1877, 1884, 1886, 1893, 1906, and 1910. The species has been recorded three times from South Carolina³—from Mt. Pleasant, August 26, 1893, and October 19, 1910, and Sullivan Island, at the entrance of Charleston Harbor, October 20, 1906; and has been taken once in New Jersey,⁴ at Cape May Court House, in the spring of 1877; once in New York,⁵ on Gardiners Island, August 4, 1886; once in Connecticut,¹ on Faulkner Island, in the autumn of 1859; and once in Nova Scotia,⁶ off Halifax Harbor, October 16, 1876. It has also been reported from the coast of Maine and from Quebec, but in neither case was the specimen preserved. Stearns states in his New England Bird Life (II, p. 342, 1883): "Mr. Purdie's manuscript informs us that a specimen was taken, but not preserved, about twelve years ago [1871?], at Booth Bay, Maine," and Comeau reports that one was seen and shot at on August 13, 1884, at Godbout, Quebec.⁷ Those who know the care and accuracy of these observers may be inclined to accept the Purdie and Comeau records although not quoted in the Check-List.—T. S. PALMER, *Washington, D. C.*

¹ George White's 'Statistics of the State of Georgia.' Cat. Fauna, p. 11, Svo. Savannah, 1849.

² Grinnell, Am. Nat., IX, p. 470, 1875.

³ Wayne, Auk, XXVIII, p. 107, 1911.

⁴ Maynard, Birds Eastern N. Am., p. 473, 1881.

⁵ Dutcher, Auk, V, p. 173, 1888.

⁶ Deane, Bull. Nutt. Ornith. Club, IV, p. 64, 1879.

⁷ Merriam, Auk, II, p. 113, 1885.

Mallard and Black Ducks at Currituck, N. C.— In looking over the shooting logs of three of the Currituck Duck Clubs the following rather interesting facts with regard to the relative frequency of Mallards and Black Ducks in Eastern North Carolina were brought to light.

The Swan Island Club is at the northern end of the sound, near its junction with the Back Bay of Virginia. The Currituck Club is some thirty miles farther south. At the former club the number of the different species taken, has only been kept for the past three years, seasons 1909–10 to 1911–12, while at the Currituck Club there are twenty-four years of records. During the twenty year period 1888–89 to 1909–10 the proportions at the Currituck Club were Mallards 47%, Blacks 100%, and this proportion does not vary essentially from season to season. It runs up as high as 80% and as low as 15%. This last happened only once, in 1899–00, and is in marked contrast to any other seasonal figure, except the season just past. The greatest Mallard year at Currituck Club was the season 1904–05.

Mr. John E. Thayer suggests that the large number of Mallards at the Currituck Club may be accounted for by the heavy baiting with corn. If this is so, it is a fact of some economic interest, but Swan Isle has also used corn, though to a less extent.

At Swan Isle for the last three winters, 1909 to 1912, the Mallards are only in the proportion of 11%. The last three seasons have certainly been poor Mallard years, but at Currituck Club they have yielded a proportion of 30%, nearly three times as great as Swan Isle.

At the False Cape Club, some fifteen miles north of Swan Island in Virginia, I have figures for the last six seasons, 1906–07 to 1911–12. The Mallards are 23%, Blacks 100%, while at Currituck Club for the same six seasons the Mallards are 37%. This shows more Mallards at False Cape than at Swan Isle, both relatively and absolutely, but the proportion of Mallards to Blacks is not nearly as great here as at the Currituck Club. We probably have to do with a question of artificial attraction which suggests that the Mallard shows a greater 'susceptibility' to corn and other grains than does the Black Duck.

For the northern part of the sound we have found from eleven to twenty-three per cent., and at the southern end, thirty-seven to forty-seven per cent., but this difference can hardly be significant in a geographical sense.

Another figure of interest can be considered. There is a chance that the Mallard is not holding out so well in numbers as the Black Duck, owing to greater interference over its breeding area. Thus we must compare an old period at Currituck Club, 1888 to 1898, with a later period, 1898–1910. The early period shows 55% of Mallards and the later one only 44%, a decrease of 9%, but this decrease is more apparent than real, because the Black Ducks have more than doubled their average yearly numbers from the first period to the second, while the Mallards are on an average a little less than twice as numerous. It is therefore probable that the Mallard is not holding out so well in this region as is the Black Duck.

The properties of all the Currituck Clubs are now gunned more systematically than in the old days, so that larger yearly averages do not necessarily point to an increase in actual numbers of the species.

A fact relative to the dispersal of the Mallard is brought out plainly by comparing the proportionate numbers of Mallards and Black Ducks month by month at Swan Isle. The season opens November 10 and ends the first of March. I give below the proportion of Mallards to Blacks month by month for the three seasons, 1909-10, 1910-11, 1911-12, and also the actual numbers of the Mallards themselves.

1909-10			1910-11			1911-12		
		Actual Nos.			Actual Nos.			Actual Nos.
Nov., 09	20%	50	Nov., 10	28%	107	Nov., 11	11%	29
Dec., 09	8.7	38	Dec., 10	20	95	Dec., 11	8	12
Jan., 10	7.7	16	Jan., 11	8.2	23	Jan., 12	2.2	4
Feb., 10	9.5	16	Feb., 11	10	7	Feb., 12	2.4	2

It is easy to see that there is a great falling off of Mallards from November to January. I believe that the diminishing numbers after November indicate the passing along of a flight.

I should attribute the extraordinarily small numbers of Mallards killed in the past season, 1911-12, at Swan Isle, to the fact that the Club cut down by at least one-half the usual output of bait, were it not for the fact that this was a very lean year for Mallards at the Currituck Club, the proportion being only 17% and the actual numbers well under one half of the usual bag. This is very nearly as low as the bad Mallard year of 1899-1900 which as mentioned above gave only 15%. Mr. Thayer assures me that the Currituck Club records can be absolutely relied upon, and I can vouch for the last three years at Swan Isle.—J. C. PHILLIPS, *Wenham, Mass.*

Dispersal of the Australian Duck (*Anas superciliosa*).—In 1911 an old pair of these birds was allowed to hatch and bring up nine young. These were banded on August 17 (not unfortunately with the American Association bands), and placed in the Wood Duck pond, where they grew their flight feathers. Late in September these young birds began to move about the place. They remained very tame. I know of three that were shot in Wenham. Two individuals, however, stayed about until December 17. By that time they had become fairly wild, having of course been more or less persecuted. After December 17 none was seen until mid-winter, when on February 20, 1912, a single one came back and was found in the winter duck yard. It allowed a close approach so that its band was plainly visible, and then flushed and flew away in an easterly direction. Up to the present date (Aug. 20) no more have returned.

The Australian duck, *Anas superciliosa* (I disregard the genus *Polionetta* because it serves no useful purpose as far as I am aware), is a widely distributed species, probably nearly, if not entirely non-migratory. As given

by Salvadori in the Catalogue of Birds, Vol. 27, it occurs 'from Java and Timor to Southern New Guinea, Australia, New Zealand sub-region, and Polynesia, including the Pelew Islands.'

Mr. Gregory M. Mathews writes me under date of Aug. 14, 1912, that there are several subspecies of this duck outside Australia which he is inclined to admit as valid because this bird is not a real migrant, although it flies long distances at times.

The return of one of my Australian ducks on February 20, suggests that there was no attempt at migration, and that the birds were either starved out or shot in this neighborhood.— J. C. PHILLIPS, *Wenham, Mass.*

The European Teal (*Nettion crecca*) again Returning to Wenham, Mass.— In 'The Auk,' 1911, page 366, I told of the migration and return of a European Teal raised in captivity here at Wenham. The bird arrived April 19, 1911 after an absence since December 6, 1910.

All summer of 1911 this bird was in or near the pond. On November 25 our captive fowl were placed in winter quarters, and our Teal vacated. Four other poorly pinioned European Teal escaped at the same time, having grown outer secondaries or new primaries long enough to enable them to fly. Our bird, however, did not leave until December 31, as she was seen several times about the pond and lake until that date. Wenham Lake closed during the first few days of January, 1912, the fall having been extremely mild.

On the morning of April 18, 1912, our bird was again back in the pond where she was hatched, having arrived during the night or early morning; thus completing her second migration. That day she was quite shy, and flushed immediately, but soon returned. I saw her first on April 20. She was then perfectly tame and could with difficulty be driven from the pond.

On April 23 another Teal appeared in the pond; whether an escape of last fall, or some other bird, can only be conjectured. This bird did not remain long, however.

It is fair, I think, to consider the first arrival the same bird as before reported, though there is no absolute evidence. The dates of spring arrival on the two years are I think interesting.— J. C. PHILLIPS, *Wenham, Mass.*

Northern Eider in South Dakota; a new record for the interior of North America.— It is my privilege to announce the capture, November 4, 1911, of a Northern Eider, *Somateria mollissima borealis*, in Lake County, eastern South Dakota. The identification is by the Biological Survey. Wells W. Cooke writes 'not only the first record for South Dakota, but the first record for the whole interior of North America.' Adrian Larson of Sioux Falls, who at my suggestion sent the specimen to Washington for identification, supplies the following notes: This bird, which is either a female or an immature male, was shot about forty miles north in a lake region 'locally called Madison Pass.' The severe cold

wave of November 1 and 2, 1911, brought the ducks south almost by the millions. The Eider was shot by a Doctor Page of Sioux Falls and is now in the possession and displayed in the place of business of William Sweet of this city.—S. S. VISHNER, *University of South Dakota, Vermillion, S. D.*

Records from Nippinickett Pond, Bridgewater, Mass.—The captures of the following ducks on Nippinickett Pond seem worthy of record. European Widgeon, *Mareca penelope*, Nov. 7, 1902. Shot by A. C. Dyke.

Two European Widgeons, *Mareca penelope*, Oct. 22, 1910, from a flock of 4 birds. Shot by Harry P. Sturtevant.

European Widgeon, *Mareca penelope*, Oct. 23, 1910. Shot by A. C. Dyke.

Hutchin's Goose, *Branta canadensis hutchinsi*, Oct. 8, 1910, from a flock of six birds, the other five being Canada Geese. Shot by Messrs. Frank C. Drake and Irving A. Hall.

All the specimens were obligingly identified by Mr. Wm. Brewster of Cambridge.—ARTHUR C. DYKE, *Bridgewater, Mass.*

Sora Rail (*Porzana carolina*) in New Mexico.—On the morning of August 27, 1912, at State College, New Mexico, I picked up, dead, an immature Sora Rail that had flown against a telephone wire and broken its neck. On the night of August 23, 1912, about 10 o'clock P. M., a flock of birds flew over me on the mesa, headed northeast—away from the Rio Grande. The size of the birds and their manner of flight, as seen by the moonlight, in conjunction with the finding of the above specimen, lead me to believe these birds were of the same species.

To my knowledge, this is the first specific record of this species in the state, certainly in this locality. There has been an unusual amount of rainfall in this region during the month of August, which may account for their presence here at this time, for our mesa country offers no inducements to them naturally.—D. E. MERRILL, *State College, N. M.*

Early Occurrence of the White-rumped Sandpiper (*Pisobia fuscicollis*) in Maine.—A male White-rumped Sandpiper in nuptial plumage was secured on April 27, 1912, at Scarborough Maine. The bird was alone.

The only other instances of its occurrence in the state in spring, known to me, are those recorded by Mr. Nathan Clifford Brown, May 30, 1881, and May 29, 1882.¹ Both of these recorded by Mr. Brown are in the collection of the Portland Society of Natural History, and the one here recorded in that of the writer.

The bird according to Mr. W. W. Cooke is rare on the Atlantic coast of the United States, in spring, north of Virginia,² and its occurrence at this

¹ Proc. Portland Society of N. H., II, p. 27.

² Bull. 35, U. S. Biol. Survey, p. 38.

season has been later than the close of the first week in May.¹—ARTHUR H. NORTON, *Portland, Me.*

Uncommon Shore-birds seen in Essex County, Massachusetts.—Clark's Pond, Ipswich, July 24, 1912, one full plumaged Killdeer Plover (*Oryzochus vociferus*). Eagle Hill, Ipswich, July 31, 1912, before any shooting was allowed we found five Killdeer Plover. Four were feeding together in a marsh hole and one flew over. The birds were so tame we could see all their markings. When startled they flew uttering their 'Kill-dee' note. Eagle Hill, Ipswich, August 7, 1912, one Buff-breasted Sandpiper (*Tryngites subruficollis*), in the grassy edges of Mr. A. B. Clark's pond. This was a new bird to me but easily identified by the general brownish yellow color and the specklings on the wings.

Nahant Beach, August 10, 1912, one Willet (probably *Catoptrophorus semipalmatus inornatus*) so exhausted after a long flight that, as it crouched on some seaweed, I thought the bird was wounded and went up to examine it. When I was within fifteen feet it stood up and stretched its wings over its back showing the beautiful black and white markings, the black axillars and the greenish legs. After a few moments the Willet took a short flight over the water giving its 'Pill-willy' notes, then returned to a clump of seaweed just ahead of me and there I left it.

Clark's Pond Ipswich, August 14, 1912, one Willet seen at close range.

Clark's Pond Ipswich, August 17, 1912, the same Willet, which Mr. Maynard said was a young Western Willet.

Eagle Hill, August 28, 1912, three Killdeer Plover apparently in full plumage.—LIDIAN E. BRIDGE, *West Medford, Mass.*

Killdeer (*Oryzochus vociferus*) at Lancaster, Mass.—I have a small pond of about three acres where I keep a collection of ducks. This year owing to the drought it was very low and the muddy shores afforded good feeding ground for any waders that might come along.

On June 16, I was surprised to hear the note of a Killdeer and going to the pond I discovered four. They seemed very tame and were busily occupied in feeding. This was in the afternoon. They remained for about an hour, then flew off. The next morning they were back again and remained until about 11 o'clock, then disappeared. The same afternoon they came again and remained until 5 o'clock, when they flew away. This continued until June 26, when I shot two, which proved to be adult males in worn plumage. The other two came back the next day. On June 30, two new ones appeared with the other two, making four in all on the pond that day. On July 1, 2, and 3, only three were seen. They remained until July 6, when they disappeared and they have not been seen since.

When they left the pond they always flew in the same direction — towards the big Clinton reservoir. My theory is that these birds bred there last year and as the shores were very low it afforded them excellent feeding

¹ l. c.

grounds, but when they returned this year, conditons were altered, the reservoir being filled to the brim. This compelled the birds to hunt for a different feeding ground and in hunting about they found my pond.—
JOHN E. THAYER, *Lancaster, Mass.*

Ocracoke Water Bird Notes.—On Royal Shoal, a small island belonging to the North Carolina Audubon Society, and situated some eight or nine miles northwest of Ocracoke, we found the following birds nesting: Laughing Gull, Common Tern and Oyster-catcher. The Gulls were in the midst of their laying, as were the Common Terns. Three pairs of Oyster-catchers inhabited the island. One nest was found with the eggs about ready to hatch, and one pair had young nearly grown, two being the complement in each case. The Black Skimmers were preparing their nesting hollows, but had not yet begun to lay. The Royal Terns seem to have almost deserted this island — where they were so numerous four or five years ago — for islands farther to the eastward, and the Least Terns are mostly back on the beaches.

The total number of eggs of the Laughing Gull and Common Tern was something over two hundred.

A flock of twenty Cormorants left the 'lump' as we approached.

A small petrel, presumably a Wilson's, was seen flying up the sound on May 23, after a rather stormy night. On the same date we found Black Skimmers very plentiful, though not yet laying, on the island in the middle of Ocracoke Inlet, with a few Common Terns nesting. Common Tern, Least Tern and Oyster-catcher were all, apparently, nesting on the beach, the Common Terns mostly on the south side of the Inlet. Young of the Oyster-catcher were seen, from a quarter grown up to the flying stage, in each case in broods of two.

This island was almost completely swept by the storm tide of the previous night, which may have destroyed a good many Tern eggs. There were many more birds around than the number of nests warranted. The few nests found were all on the small, unswept area, of course.—H. H. BRIMLEY, *Raleigh, N. C.*

Oreortyx in Idaho.—Notes appearing in 'The Auk' of April, 1911 and 1912, refer to the range of *Oreortyx* being extended eastward to near the Idaho-Oregon line,—specifically, Vale, Oregon. My observation is that not only has it been long established in southwest Idaho, but that its range extends at least 125 miles beyond the Oregon line.

Four years ago a covey of eight along Indian Creek several miles northwest of Nampa was wiped out by hunters. Two years ago a number were taken in the Boise bottoms eight miles north of this place. For ten years more they have been common in the Owyhee foothills some forty miles south of Nampa; in fact, so numerous are they that hunters from here regularly visit that section at the opening of the shooting season, two guns on one occasion killing 44 Quail in two hours.

A rancher from Twin Falls, 100 miles south and 145 miles east of Vale, Ore., tells me the 'Blue Quail' appeared there several years ago, while a report from Shoshone, 75 m. south and 150 east of Vale, says they are becoming plentiful near that place. I am unable to verify by personal observation either of these last reports, but have no reason to doubt them.

It is a fair supposition that the birds taken near Nampa were 'explorers,' merely crossing the valley to the hills beyond, where they will doubtless be found soon if indeed they are not already established there.

I have examined numerous birds in the flesh from the Owyhee section and would pronounce them typical *plumifera*, though I have not the material in my collection for a comparison. Hunters insist that they find another variety, similar in coloring but smaller and with shorter plumes.—L. E. WYMAN, *Nampa, Ida.*

Passenger Pigeon (*Ectopistes migratorius*) in Alberta.—The records of the Passenger Pigeon printed of late in 'The Auk,'¹ cover practically all of its former range except the extreme northwest. The account of its occurrence in Alberta is contained in a little known book entitled 'Saskatchewan and the Rocky Mountains. A diary and narrative of travel, sport, and adventure, during a journey through the Hudson's Bay Company's Territories in 1859 and 1860. By the Earl of Southesk.' Edinburgh, 1875, 1-448. On May 28, 1859, when in northwestern Minnesota near Pembina, he says, "I stalked and shot some pigeons." When near Qu' Appelle Fort, Saskatchewan, July 2, they "discovered a few pigeons in a little grove." From Edmonton, Alberta, the party went westward and August 22, when near the Lobstick River the record reads, "We also saw a good many pigeons, one of which I shot with my rifle. They were plump, compact little birds, and made delicious eating." The next day, when a few miles further west, two were shot.

These are apparently the first and only records of the Passenger Pigeon in Alberta.—WELLS W. COOKE, *Biological Survey, Washington, D. C.*

The Band-tailed Pigeon (*Columba fasciata fasciata*) in North Dakota.—Recently I have been having some interesting correspondence with Mr. C. J. Campbell, whose home is at Englevale, North Dakota. From the Editor of 'Outer's Book' I learned that Mr. Campbell had shot a specimen of the Band-tailed Pigeon near Englevale, and I investigated the matter until I was satisfied of the truth of the statement; and now, with his permission, I publish his last letter to me on the subject, it being dated at his home on the 1st of July, 1912, and runs as follows:—"Dear Sir:—In reply to your letter of June 27th I am perfectly willing you should publish the facts as stated in any of my letters. The Band-tailed Pigeon referred to was shot by me on the evening of June 2nd in this village, which is situated in Ransom Co., N. D., about 50 miles from the Minnesota State

¹ 1910, 428; 1911, 346 and 427.

line and about 30 from the South Dakota line. I could not tell the sex. I only saw the one bird. When first seen a pair of Kingbirds were chasing it and it flew into a thick willow hedge to escape them. This Pigeon was about the size of a Passenger Pigeon or a trifle smaller, white collar around back part of neck. The end of tail square, that is tail feathers all of equal length. When the tail feathers were held spread out it plainly showed the band of dull or dirty white.

Yours truly,

CHAS. J. CAMPBELL."

There may be some significance in the capture of this bird so far off its range, when taken in connection with the outrageous slaughter of many hundreds of this species, which recently took place in Southern California, as described in the May-June (1912) issue of 'The Condor' (p. 108). R. W. SHUFELDT, *Washington, D. C.*

On the Alleged Egg-carrying Habit of the Band-tailed Pigeon.—In the July 'Auk' Mr. Wallace Craig protests at some length against the general acceptance of the belief that the Band-tailed Pigeon carries its egg from the nest on occasion, and incubates it on any limb of a tree on which it may happen to alight, as published in Bendire's 'Life Histories of North American Birds.' He remarks, quite rightly, that such an extraordinary act should not be believed except upon the best of evidence, which he asserts is not at hand.

Doubtless other western ornithologists besides myself have read with amusement this tale of the pigeon's actions, but without feeling the need of formally refuting the story. This, however, should have been done years ago, for such stories are sometimes repeatedly and widely quoted, as this one has been, until they are generally accepted as established facts. It is pertinent, in this connection, to refer to Mr. Herbert Brown's interesting account of the Masked Bob-white (Auk, XXI, 1904, pp. 209-213), where statements by Major Bendire's informant, referring to the species treated, and also quoted in Bendire's 'Life Histories,' are discussed and rated at about their true value.

Under the circumstances it is most unfortunate that many such statements and records should have been so widely repeated in ornithological literature. As the years go by such erroneous 'records' become increasingly difficult to correct, and while we can still do so, every effort should be made toward their elimination.

In this connection, and as an example of the insistence of an erroneous record, there can be cited the generally accepted statement of the Band-tailed Pigeons' breeding in southern Arizona during the entire year. This is positively asserted as an accepted fact in various books dealing with western ornithology, and is, I believe, traceable back to the same source as the egg-carrying tale. It is also contrary to fact. The Band-tailed

Pigeon is not resident in the parts of Arizona in which it breeds—the Transition zone—and there are no published records of breeding during the winter months. In fact, I do not know of a definite record of the occurrence of the species anywhere in the state in mid-winter, and I have had occasion to make careful search through ornithological literature dealing with Arizona.

Mr. Craig's objection is abundantly justified by the ridiculous nature of the story he cites, which, without a particle of corroborative evidence, has been so generally accepted as sober truth. It induces me to publish this statement regarding the character of other records from the same source.—H. S. SWARTH, *Museum of Vertebrate Zoology, University of California, Berkeley, California.*

Pigeon Hawk in South Carolina in Winter.—On February 26, 1911, I took a specimen of this species (*Falco columbarius columbarius*) in the brown immature plumage in St. Andrews Parish, near Charleston. The skin is at present in the collection of the Charleston Museum. This is the first record for this species taken during the winter months. Mr. A. T. Wayne records (Auk, XXVIII, 1911, p. 265) the occurrence of two adults which he observed on Nov. 29, 1910, and Jan. 14 and 16, 1911, but was unable to secure. These records establish the Pigeon Hawk as a rare winter visitant in South Carolina.—JULIAN MITCHELL, JR., *Charleston, S. C.*

Red-headed Woodpecker at Newburyport, Mass.—On July 13, 1912, while engaged in photographing, in a mowing field, the nest and eggs of the Ring-necked Pheasant, my attention was caught by a flash of bold color in a nearby elm, and on the completion of my work with the camera, I went to investigate the owner of the brilliant plumage. Soon locating him on a dead limb near the upper centre of the tree, I readily recognized him as a Red-headed Woodpecker (*Melanerpes erythrocephalus*), an uncommon bird in this part of New England. I had a good view of him, covering a period of several minutes, as he explored the points of interest on the dead limbs of the tree. After a little while he took flight, in a northerly direction, but although I walked for some little distance, I was unsuccessful in getting another glimpse of him.

Inquiries in the neighborhood brought out the fact that he had been seen several times, earlier in the season, but I could find no one who knew of his breeding here. Doubtless he was a solitary wanderer who had strayed from his usual range.

Some twenty years ago a pair of these birds were found nesting in an old orchard in the southern end of the town. Just at the time that the four young, were ready to fly, the whole family was taken, and now graces the private collection of a resident of the town.—S. WALDO BAILEY, *Newburyport, Mass.*

The Case of a Crow and a Ruffed Grouse.— On May 12, 1912, while automobiling through Stoughton, Mass., Mr. Charles A. Coolidge suddenly came upon a Crow flying slowly across the road with a heavy burden. In its efforts to escape, the Crow dropped its booty, which proved to be a dead Ruffed Grouse, still warm as in life.

My examination elicited the following facts: An adult female Ruffed Grouse, weighing one and a quarter pounds; abdomen entirely bare as in incubation; feathers back of right ear and below left eye stained with blood; eyes intact; many feathers on the right side of the neck and some on the left side, including the whole of the neck-tuft on that side, missing. An effusion of blood the size of a silver dollar in the muscles of the right breast, and a few small subcutaneous ones on both breasts; an irregular rent in the skin a quarter of an inch long behind the right ear, and much clotted blood there and around the exterior of the base of skull and neck; a slight tear in the skin below the left eye. The skull was not injured and the brain was intact. There were no signs of gun-shot injury.

The ovary was full of small eggs, none larger than a number six shot. The crop was stuffed with the young leaves and flower buds of the apple, and the stomach was filled with the semi-digested remains of the same. The bird was plump and in good condition, and showed no signs of disease.

The interpretation of these post-mortem findings and of the observed history is a matter for conjecture and the following theories are offered:

(1) That the Crow flying close to the ground in open woods perceived the incubating Grouse, who, trusting to her protective coloration, remained immobile on her nest, and received her death blow behind the right ear.

(2) That the Crow in attempting to steal the chicks of the Grouse was set upon by the irate mother with the disastrous results observed.

(3) That the Crow attacked the Grouse while busily engaged in budding the apple tree, and that the stunned bird fell to the ground where a few more blows finished it.

(4) That the Grouse was killed by a hawk, was abandoned and at once seized by the Crow.

(5) That the Grouse killed itself by flying against some obstacle, and that its dead body was at once taken by the Crow.

The fall of the Grouse to the ground before life was entirely extinct, which might have happened according to theory 3, 4 and 5 would account for the contusion and hemorrhage of the breast. This hemorrhage would not have occurred when the Crow dropped the dead body into the road. It hardly seems probable that a hawk would have abandoned such a rich booty, or that it would not have left marks of its talons. In the case of an obstacle one would expect to find hemorrhage over or under the front of the skull. By exclusion therefore, theory number 3 seems to be the most probable one.

In whatever way the tragedy occurred it is certainly surprising that a Crow should have succeeded in flying with such a heavy burden as a Ruffed Grouse, and on this account alone, if for no other, the case is worth putting on record.— CHARLES W. TOWNSEND, M. D., *Boston, Mass.*

Concerning the Hawaiian Linnet.— In 'The Auk' for July, 1912, pages 336–338, Mr. John C. Phillips makes a contribution to the discussion of the interesting case of the Linnet of the Hawaiian Islands, where an apparent change in color has come about since the introduction of the bird forty of more years ago. The above writer's remarks were evidently stimulated by two things: He did not approve of the name *mutans*, this having been proposed by me in order to give the supposedly new form systematic standing; and his doubts were clearly strong as to the Hawaiian Linnet possessing any really distinctive character.

In the first place, I was chagrined that anyone after reading my former paper should interpret my use of the name *mutans* as signifying my belief that the Hawaiian Linnet owed its character to the definite process of late commonly called mutation. I see now that such an inference ought to have been anticipated, and I have a due feeling of humiliation. The word *mutans* was selected because it was the Latin equivalent of the present participle "changing," referring of course to the apparent existence in this case of a species in *process of change*,—not by any means through de Vriesian mutation, but by some other process, possibly one among those discussed in my previous paper.

In the second place, as to the value of the color-character which the Hawaiian Linnet displays, rather irregularly it is admitted, various considerations are mentioned by Mr. Phillips. One thing, however, certainly supports the notion that degree of redness (counting lemon yellow, cadmium yellow, orange, orange vermilion, poppy red, crimson, and various dilutions of these) may be a real racial or specific character, therefore of an intrinsic or germinal nature. This is, that over and over again in the best systematic writings on birds we find fine differences within this series of pigment colors recognized as perfectly good characters. The following genera among our North American Fringillidæ afford examples: *Acanthis*, *Pinicola*, *Carpodacus* (otherwise than in the disputed case), and *Loxia*. If such a character, whether or not in company with differences in size, etc., is of systematic value in any of these cases, why not in that of the Hawaiian Linnet?

The paramount interest in the problem under discussion, rests on the apparent fact that we have here a character *originating*, possibly becoming intrinsic; in other words, a species in process of change. Further collections of linnets from the Hawaiian Islands are immensely to be desired; and as Mr. Phillips suggests, someone must work with live birds under various conditions, so as to bring light from experimental sources.—J. GRINNELL, *Museum of Vertebrate Zoology, Berkeley, California.*

The Acadian Sharp-tailed Sparrow and Other Birds at Plymouth, Mass.— The winter had been quite severe and on February 2, 1912, the harbor was nearly frozen over, only the channels, some distance off shore, being open. The shore was covered with snow and broken ice. Gulls and ducks were numerous around the open water in mid-harbor.

Where a small stream entered the harbor, I noticed quite a modification of the otherwise prevalent, boreal conditions. Waste water from some mills enters this stream, evidently raising the temperature considerably, for a mist hung over the stream and the beach was bare of ice and snow for some thirty feet on either side of the brook where it entered the harbor. The birds seemed to have taken advantage of this very local, climatic condition.

About a hundred Herring Gulls were feeding about the mouth of the stream; fifty Horned Larks were busy gleaning edible bits and two had a spirited contest for a choice morsel, while at times they twittered to each other in low, musical tones; and a bright and active Acadian Sharp-tailed Sparrow was noticed among the Larks. I observed it for some time, and it came within eight feet of me, searching for food among the sea-weed and stones, and rested for a minute or more upon a large beach stone. The creamy-buff appearance, of the back and head markings, breast and underparts, longitudinal gray side streaks, the contour of the bill, and the sharp-tipped tail feathers were distinctly visible. I was pleased to note this species on our coast in severe mid-winter.

I am reasonably sure that this sparrow was not *maritimus* which species has some late, northern records, as its larger size and different bill would serve to identify it.

I continued my observations at this point about an hour and while here a male Golden-eye whistled overhead, so near that his attractive dress and white spot near eye were distinctly seen. Also a fine adult, male Great Black-backed Gull was noticed with some Herring Gulls near a channel.—CHARLES L. PHILLIPS, Taunton, Mass.

Notes on the Dickcissel in Colorado.—During the week of August fourth to eleventh, 1912, while visiting friends at the ranch of J. W. Ramsey, near Crook, Colorado, in company with Mr. Dean Babcock, of Estes Park, I was fortunate in finding a number of Dickcissels (*Spiza americana*). They were first seen and heard singing August 6. Mr. Babcock had been familiar with the bird in the east and he told me he felt positive of the song. As they were very wary some difficulty was experienced in getting within gunshot, but the first specimen was finally secured, confirming the primary identification. Five specimens in all were taken, four males and one female, a pair of which are now mounted in the Colorado Museum of Natural History. We saw at least twelve individuals on the sixth and on subsequent days in other fields, enough to make a conservative total of twenty for the vicinity.

They seemed to prefer the moist meadows of sweet clover and sunflower, rarely going to the adjoining grain fields. Their habit (so common with many birds) of remaining on the highest stalk in a clump while singing, rendered them very conspicuous but difficult to approach. The note which had proved so instrumental in the identification consisted of six syllables divided into two parts; the first part of two syllables, slightly slower and higher pitched than the last of four syllables.

All of the specimens collected were in more or less worn plumage, but only one had made any progress with a molt, and on this bird it is only noticeable in the tail, half of which was composed of new feathers.— F. C. LINCOLN, Assistant, Dept. of Ornithology, Colo. Museum of Natural History, Denver.

Proper Name for the Nashville Warbler.— The specific name of the Nashville Warbler was changed in the eighth supplement to the A. O. U. Check-List from *ruficapilla* to *rubricapilla* because "*Sylvia ruficapilla* Wils. (1810), is preoccupied by *Sylvia ruficapilla* Lath. 1790." The fact is that *Sylvia ruficapilla* Latham, 1790, is not an original description, but is merely the placing in the genus *Sylvia* of *Motacilla ruficapilla* Gmelin, 1789, and as such does not preoccupy *Sylvia ruficapilla* Wilson.

Hence the name of the Nashville Warbler should be *Vermivora ruficapilla* Wilson, and the reference, *Sylvia ruficapilla* Wilson, Am. Orn. III, 1811, 120, pl. 27, fig. 3.— WELLS W. COOKE, Biological Survey, Washington, D. C.

Abundance of the Cape May Warbler (*Dendroica tigrina*) around Quebec.— It is surprising to note that this rare warbler has been found very commonly in the woods around Quebec this spring, and even in the parks of the city. Two young ornithologists, P. W. Cook and A. W. Ahern, of this city, shot about fifteen, of which twelve were brought to me. They met with six to eight bands of the warbler, each containing something over a score of birds, and these in different localities, they seemed to be almost as numerous as the Myrtle Warbler. The first specimen seen, which was in company with a small flock of Black-throated Green Warblers, was shot on the 9th of May and by the 18th the species was very common. The last was seen on the 25th.

It has also been noticed that many other warblers were more common this spring than usually, especially the Blackburnian and Bay-breasted.— C. E. DIONNE, Quebec, Can.

Mimicry in the Song of the Catbird.— Though belonging to a distinguished and accomplished family of singers numbering among its members such delightful songsters as the Brown Thrasher, Mockingbird and more distantly related Carolina Wren, the Catbird figures with a more modest pretention to song and until recently I had supposed its vocal powers limited to its own individual lyrical, and sometimes seemingly labored song. But on July 5, 1912, while working in a meadow adjacent to a small brook with its usual tangle of alder, raspberry and elder I noted with considerable surprise and interest, more so because of the day-light hour, 11 A. M., the song of a Whip-poor-will, somewhat subdued and minor in quality, but clear and distinct nevertheless. It was several times repeated from the nearby thicket. So out of the usual was it at this hour that I went at once to reconnoiter and was not a little surprised to find the

author, not a Whip-poor-will but a Catbird! So far as my observation extends he was certainly acting in a new rôle. Two or three times later in the day I heard the same performance repeated, and subsequent visits to the same locality have, on two occasions, enabled me to substantially confirm my first conclusions as to the accomplishments of this individual.

It is of further interest to note that in this particular locality the Whip-poor-will is seldom heard. One would have to travel several miles to a more 'brushy' or thickly wooded surrounding to hear them. These observations lead to the query, how then did the Catbird 'learn his lesson' and how much progress and to what degree do some individuals of the species attain in mimicry?—S. WALDO BAILEY, *Newburyport, Mass.*

Another Occurrence of the Blue-gray Gnatcatcher in Essex County, Massachusetts.—I should like to record a full plumaged Blue-gray Gnatcatcher (*Poliophtila cærulea cærulea*) seen in the pitch pine trees of the Ipswich Dunes on August 24, 1912.

The bird when first seen was flitting about the trees like a Kinglet uttering a curious little call note which at once attracted my attention. I coaxed the bird out on to the lower dead limb of a gray birch by squeaking, so that we were able to observe it carefully for ten of fifteen minutes although it was quite restless.

The bird was seen by Miss E. D. Boardman, Edmund Bridge and myself.
—LIDIAN E. BRIDGE, *West Medford, Mass.*

A Third Blue-gray Gnatcatcher in Maine.—Late in the afternoon of August 25, 1912, I heard several times near my house on Vaughan Street, Portland, what I believed to be the call-note of the Blue-gray Gnatcatcher (*Poliophtila cærulea cærulea*). It proceeded from the tops of tall elms, bordering the street, where a number of small birds were flitting about, all too far away, however, to be identified by the eye. About six o'clock, the next morning, I again heard the call-note, now coming from an apple tree on my lawn, and I soon got a fair view of its author at close range. After a moment or two he flew to an almost leafless old apple tree on a near-by vacant lot where, as I stood under the tree, I watched him at my leisure, often within six or seven feet. At last, up to this time quite alone, he flew away southward, a hundred yards or so, to a group of elms, cedars and other trees, and was at once lost in a numerous band of bird migrants.

If we are to accept the records¹ literally, only three Gnatcatchers, all told, have made their way to Maine; but to the writer, before whom the three examples have so casually presented themselves,—with a possible fourth not to be overlooked,—it seems likely enough that more than a few others have come and gone unobserved, even in recent years.—NATHAN CLIFFORD BROWN, *Portland, Maine.*

¹ Bull. Nutt. Orn. Club, V, pp. 236-237; Auk, XIII, pp. 264-265.

RECENT LITERATURE.

Barrows' Michigan Bird Life.¹—A comparison of Cook's 'Birds of Michigan' published by the Michigan Agricultural Experiment Station in 1893 and the present special bulletin of the state Agricultural College, furnishes a good illustration of the important position that the study and preservation of our native birds have attained during the past two decades. Where twenty years ago a pamphlet of 148 pages fulfilled the demand, the state today feels fully justified in the issue of this portly volume of 822 pages with 70 plates and 152 figures.

Prof. Barrows is to be congratulated upon the manner in which he has assembled his materials, and in his happy treatment of the subjects discussed in the introduction, especially 'migration' and 'how to study birds.' We heartily agree with him too when he says "The great importance of wild birds to the agriculturist may be readily conceded. Nevertheless it seems very desirable, at this time, that we should recognize the fact that all the wild things of our country, birds, mammals, insects, plants, have a right to protection, preservation, recognition, entirely apart from their *economic* status, using that word to indicate merely the amount of good or harm in dollars and cents which can be attributed to them. The fox, the Crow, the Kingfisher, the muskrat, may or may not, in the long run, be 'more beneficial than harmful,' yet each in its own way has a scientific, an æsthetic, a human value, which cannot be estimated in dollars and cents and which should forever protect him from extreme persecution, and above all from final extinction."

Our author's attitude toward collecting specimens moreover seems admirably expressed. While he believes in careful restriction in the granting of permits he says: "A moment's thought will convince anyone that the student who searches the woods carefully for a bird which he has never seen, who follows up each unknown call or song, watches with care each doubtful and illusive form which suggests the bird desired, and finally, perhaps after hundreds of disappointments, kills a specimen of the much coveted species and measures, preserves and labels it, has gained a knowledge of the appearance, habits, notes, size and structure of this species which could be obtained in no other possible way. Not only has he gained

¹ Michigan Bird Life | A List of all the Bird Species known to occur on the State together with | an outline of their Classification and an account of the | Life History of Each Species, with special reference to its | Relation to Agriculture. With Seventy Full-page Plates | and One Hundred and Fifty-two Text Figures | By | Walter Bradford Barrows, S. B., | Professor of Zoölogy and Physiology and | Curator of the General Museum | Special Bulletin | of the | Department of Zoölogy and Physiology | of the | Michigan Agricultural College | Published by the Michigan Agricultural College | 1912 — 8vo. pp. 822, 70 plates 152 text figures — Sold at the College. 45 cts. paper, 60 cts. cloth; transportation 35 cts. extra, must be prepaid.

all this knowledge with regard to this particular specimen, but in doing so he has exercised, consciously or unconsciously, his powers of observation, comparison and discrimination with regard to scores of other birds, so that his experience has been broadened and his power and judgment very materially strengthened."

The main text of Prof. Barrows work follows the nomenclature of the new A. O. U. Check-List. After the name comes a paragraph of popular synonyms and such technical synonyms as are used in the standard works; then follows a brief summary of the more striking characters by which the species may be recognized; an outline of its general distribution; a discussion of its occurrence in Michigan, its habits, nesting, etc., often at considerable length; and finally, a technical description. Much valuable economic and historic matter is incorporated in the articles the object being to select 'such information as would be useful and interesting.' Of Cook's 336 species 30 have been relegated to the hypothetical list while 20 others have been added making a total of 326 positively identified within the limits of the state.

Each family is preceded by a key for use with the specimen in hand, while six appendices treat respectively of, Additions and Corrections, Hypothetical List, Bibliography, Glossary, Outline of Classification of North American Birds (families and orders), and List of Contributors.

The value of the bibliography is materially lessened by the fact that the titles of each author are printed continuously, in one paragraph with title, reference date, etc., all in the same style of type which makes it exceedingly difficult to consult. The general typography and appearance of the work are excellent and the half tones and line cuts which are drawn from various sources, some of them original, are usually well printed.

Prof. Barrows has evidently had the cordial support of all Michigan ornithologists and bird lovers in his task and the result is one of which the state and the author may well be proud.—W. S.

Willett's Birds of the Pacific Slope of Southern California.¹—

In this recent publication of the Cooper Ornithological Club forming number 7 of the Pacific Coast Avifauna series, Mr. Willett presents a carefully prepared annotated list of the birds of 'the Pacific slope of southern California from, and including Santa Barbara County, to the Mexican line and from the summit of the mountains to the ocean, also including all the islands of the Santa Barbara group.' The work was originally intended as a revision of Grinnell's 'Birds of the Pacific Slope of Los Angeles County' published in 1898, but it was later thought better to extend its scope to the above limits.

The style and typography of the work are excellent and conform to other numbers of the same series. In nomenclature the author follows the

¹ Pacific Coast Avifauna, Number 7. Birds of the Pacific Slope of Southern California. By George Willett, Cooper Ornithological Club. Hollywood, California. Published by the Club. July 25, 1912 — 8vo., pp. 1-122.

latest edition of the A. O. U. Check-List discussing in detail his reasons for differing from the A. O. U. Committee in the distribution of several species. We note the following cases where Mr. Willett's evidence leads him to differ with the statements of the Check-List.

Brachyramphus marmoratus is stated in the Check-List to range south to San Diego in winter but Mr. Willett can find no record south of Santa Barbara.

Branta canadensis occidentalis is credited with ranging to southern California in winter but there seems to be no record for the region covered by the present paper.

Oreortyx picta plumifera is considered by Mr. Willett, to include all southern California birds. Those from the San Gabriel and San Bernardino Mountains are referred to *O. p. confinis* in the Check-List but Messrs. Grinnell and Swarth after careful study of the matter would refer all to *plumifera*.

Following the opinion of Messrs. Ridgway and Oberholser he excludes *Empidonax griseus* from California referring the birds so called to *E. wrighti*.

Aphelocoma californica obscura is also excluded from California, the birds breeding from Los Angeles to San Bernardino which are referred to this form in the Check-List, proving to be, in the opinion of Messrs. Grinnell and Swarth, referable to *A. c. californica*.

Careful local studies of this kind are just what are needed to straighten out the details in the distribution of our birds, and Mr. Willett's contribution is most welcome.

We note but few typographical or other errors, but since the author invites corrections we may mention that the Avocets noted by Dr. Newberry (p. 35) were in the winter of 1855 not 1885 and the Audubon reference on p. 71 should be to the Ornithological Biography not the Elephant Folio. We might also call attention to an earlier publication of Evermann's 'Birds observed in Ventura County, Cal.' which appeared in Vol. 1, No. 8 (Jan. 1886), pp. 77-89, of the *Pacific Science Monthly*, a small journal edited by Stephen Bowers, Ph.D., and published at San Buenaventura, Cal., apparently as the organ of the Ventura Society of Natural History.

This title does not appear in Grinnell's Bibliography of California Ornithology. Except as to nomenclature the paper is essentially the same as that in 'The Auk' for 1886. *Polioptila melanura* however, is included (erroneously) as a rare resident.—W. S.

Mathews' Birds of Australia.¹—Three parts of this monumental work have been received since the last notice in 'The Auk.' Part 6 of Volume I, bearing date, January 31, 1912, consists of title page, contents, preface and index of the first volume, while Part 1 of Volume II, May 30, 1912, and Part 2 of Volume II, July 31, 1912, comprising 236 pages and 27 plates are devoted to the Petrels.

¹The Birds of Australia. By Gregory M. Mathews. With hand-coloured Plates. Roy. 4to. Witherby and Co., London.

The high standard set in Volume I is maintained in the parts before us, both plates and letter press being beautifully executed, while the history, synonymy and relationship of the various species are treated at length. As Mr. Mathews states in the preface to Volume I, the accounts of the life history of some species are necessarily meagre on account of the lack of reliable information; a condition that is familiar to compilers of life histories of birds in other countries as well as Australia, and one that should be constantly remembered by field ornithologists. Mr. Mathews' work may leave little to be said on the systematic side of Australian ornithology but the members of the Royal Australasian Ornithologists' Union will still have a wide field open to them in completing the accounts of the life and habits of their birds.

The recently rediscovered Solander manuscripts are reprinted as well as other matter relative to the early descriptions and discoveries of Petrels, and as is usual in the author's investigations he finds quite a number of races which he regards as separable, many of them from outside of Australian waters.

We note the following new forms described in the parts now before us. In part 1: *Oceanites oceanicus exasperatus*, New Zealand Seas; *Oceanites nereis couesi*, Kerguelen Isl.; *O. n. chubbi*, Falkland Isl.; *Pelagodroma marina dulcia*, W. Australia; *P. m. maoriana*, Chatham and Aukland Isls.; *P. m. howei*, E. Australia; *Fregetta tubulata*, 'Gould' ms., Australian coast; *Puffinus couesi*, Californian coast; *P. assimilis kempti*, Chatham Isls.; *P. a. tunneyi*, W. Australian, *P. lherminieri boydi*, Cape Verde Isls.; *P. l. becki*, Culpepper and Wenman Isls., Galapagos; *P. l. nugaz*, 'Solander' ms., Queensland; *Puffinus reinholdi*, New Zealand; *P. r. huttoni*, Snare Is., N. Z. *P. pacificus hamiltoni*, Seychelles; *P. p. alleni*, San Benedicto Coast of California; *P. p. laysani*, Laysan; *P. p. royanus*, E. Australia; *P. carneipes hullianus*, Norfolk Isl.; *P. c. hakodate*, Japan; *P. c. carbonarius* 'Solander' ms.; *Procellaria æquinoctialis mixta*, Cape Seas; *P. a. steadi*, New Zealand; *P. a. brabournei*, West Coast, S. A. In part 2:

Pagodroma confusa, Cape Adare, Victoria Land; *Macronectes giganteus solanderi*, Falkland Isls.; *M. g. halli*, Kerguelen Isl.; *M. g. wilsoni*, Ross Sea; *M. g. forsteri*, west coast of South America; *Prion vittatus keyteli*, Tristan d'Acunha, *P. v. gouldi*, Bass Strait; *P. v. macgillivrayi*, St. Paul's, Indian Ocean; *P. v. missus*, W. Australia; *Pseudoprion turtur eatoni*, Kerguelen; *P. l. solanderi*, west coast South America; *P. l. huttoni*, Chatham Isls.; *P. l. crassirostris*, Bounty Isls.; *Heteroprion belcheri*, coast of Victoria; *H. desolatus mattingleyi*, E. Australian Seas; *H. d. perrugneyi*, Cape Seas; *H. d. macquariensis*, Macquarie Isl.; *H. d. alter*, Auckland Isls. Three new genera are proposed as follows *Fregettornis*, type *Fregetta grallaria*; *Nesofregetta*, type *F. næstissima*; *Heteroprion*, type *H. belcheri*.

Mr. Mathews points out that *Fregetta leucogaster* Gould should replace *F. grallaria* Vieill. in the A. O. U. Check-List, the two being separable and the latter restricted to Australian waters. *Puffinus auricularis* Towns. he regards as identical with *P. opisthomelas* Coues, while the bird generally

so called is renamed *P. couesi*. *P. griseus* is again subdivided, our Atlantic form being *P. g. stricklandi*, while our Pacific form is *P. g. chilensis*. Taken altogether these parts of Mr. Mathews' work constitute one of the most important contributions to our knowledge of the Procellariiformes that has yet appeared.— W. S.

The Austral Avian Record No. 3.¹— In this number Mr. Mathews discusses the coloration of the head and neck of the Australian Cassowary and some rare publications by S. Diggles on new Australian birds. Another list of additions and corrections to the author's 'Reference List' of the birds of Australia also appears containing twenty-two additional new subspecies.— W. S.

Bryant on The Present and Future Status of the California Valley Quail.²— The investigation reported in this paper shows conclusively that the preservation of this well known game bird is likely to be seriously threatened if present conditions in California continue. The increase in gunners, extension of agriculture and destruction of cover are shown to be the most serious factors.

The issue of 12,500 hunting licenses in southern California in 1910, and the merciless slaughter of Quail by market gunners and others in the past, clearly show where lies the responsibility for the decrease in numbers that Mr. Bryant has reported. All aspects of the question are carefully considered and steps for the furnishing of food and cover, and for limiting the amount of hunting, so that the annual destruction does not exceed the production of young, are recommended.— W. S.

Grinnell's Systematic List of the Birds of California.³—The object of this publication seems to be to present a list of Californian Birds in a sequence which the author regards as representing the most modern ideas of classification — *i. e.* as presented in Knowlton's 'Birds of the World.' As in Mr. Grinnell's previous catalogue, many races described by him but not recognized in the A. O. U. Check-List are included. Useful as the list is in illustrating a modern system of classification it is to be hoped, as a matter of convenience to all American Ornithologists, that it be not followed in future publications of the Cooper Ornithological Club. In faunal lists matters of classification are of secondary importance as compared with the great convenience of uniformity of sequence. Mr. Grinnell's list enumerates 530 species and subspecies, 55 of which are regarded as of casual or accidental occurrence.— W. S.

¹ The Austral Avian Record, Vol. I, No. 3. Witherby & Co., London. June 28, 1912.

² The Present and Future Status of the California Valley Quail. By Harold C. Bryant. The Condor, Vol. XIV, July, 1912, pp. 131-142.

³ A Systematic List of the Birds of California. Pacific Coast Avifauna, No. 8, Cooper Ornithological Club, Hollywood, Cal. August 30, 1912. pp. 1-23.

Chapman on New Colombian Birds.¹— Mr. Chapman in this paper, which is preliminary to a detailed one now in preparation, presents the first report on the results of the ornithological investigations of the American Museum expedition to Colombia, which was planned and directed by him, and with which he was personally associated from March to June, 1911. This contribution consists of a brief outline of the personnel and itinerary of the expedition to date, with a map and diagnoses of 40 new species and subspecies of birds.

While most of these are from the Cauca region, the Paramo of Santa Isabel and other parts of western Colombia others are from Santa Marta, and one, *Synallaxis gularis cinereiventris*, from Merada, Venezuela. The distinctness of these latter forms was brought out by a study of the Cauca material. The interest which attaches to this paper will make all students of the Neotropical avifauna eager for the appearance of Mr. Chapman's detailed report.— W. S.

Chapman on a New Ibis from Mt. Kenia.²— Mr. and Mrs. C. E. Akeley have presented to the American Museum a pair of Ibises with their nest, a portion of an egg-shell, and three young, which they collected on Mt. Kenia, British East Africa, in September, 1910. Mr. Chapman finds that the specimens represent not only a new species but a new generic type, most nearly related to *Hagedashia* but resembling in some respects *Lophotibis* and *Lampribus*. He has named the species *Oreoibis akleyorum*.— W. S.

Richmond on New Birds from the West Coast of Sumatra.³— The collections made by Dr. W. L. Abbott in 1903 and 1904 on islands off the west coast of Sumatra, and presented to the United States National Museum, have yielded the following new forms which are here named and described by Dr. C. W. Richmond. *Muscadivores consobrina babiensis*, Pulo Babi; *Thriponax javensis butlikoferi*, Nias Island; *Dicaeum sumatranum batuense*, Batu; *Alcedo meninting proxima*, North Pagi; *Copsychus saularis pagiensis*, North Pagi.— W. S.

Beebe on New Blood Pheasants.⁴— Mr. Beebe's study of the specimens of Pheasants obtained on the Kuser-Beebe Expedition has brought to light the existence of two undescribed forms of Blood Pheasant which are here

¹ Diagnoses of apparently new Colombian Birds. By Frank M. Chapman. Bulletin Amer. Mus. Nat. Hist., XXXI, Art. xvi, pp. 139-166. July 23, 1912.

² A New Ibis from Mt. Kenia, British East Africa. By Frank M. Chapman. Bulletin Amer. Mus. Nat. Hist., Vol. XXXI, Art. xxi, pp. 235-238. August 6, 1912.

³ Descriptions of Five New Birds from the West Coast of Sumatra. By Charles W. Richmond. Proc. Biol. Soc. of Washington. Vol. XXV, pp. 103-106. June 15 [= 14], 1912.

⁴ New Blood Pheasants. By C. William Beebe. Zoologica, Scientific Contributions of the New York Zoological Society, Vol. 1, No. 10, pp. 189-193. Aug. 17, 1912.

discussed in detail and named. *Ithaginis kuseri* is from northwestern Yunnan, while *I. cruentus affinis* is proposed for the bird of southern Sikkim, as contrasted with *I. cruentus cruentus* of Nepal and northern Sikkim.— W. S.

Oliver on The Geographic Relationships of the Birds of Lord Howe, Norfolk, and the Kermadec Islands.¹— In this interesting paper Mr. Oliver discusses the relationship of the avifauna of these three islands. His conclusions are that their affinity is clearly with New Zealand rather than with Australia, while the New Caledonian element that is present leads him to endorse the theory of a land bridge between the latter island and New Zealand, of which Lord Howe was a part and Norfolk Island but slightly separated. These two islands he would regard as forming one province of the New Zealand region while the Kermadecs he thinks should form a separate province, whose fauna is derived wholly from transoceanic migration, without any of the wingless Rails or other species of Lord Howe Island which apparently date from the time of the land bridge. Mr. Oliver cites examples outside of the avifauna in support of his views but it would be interesting to see how a detailed study of other groups of animals or plants would agree with them.— W. S.

Gladstone's The Vertebrate Fauna of Dumfriesshire.²— Mr. Gladstone's beautifully printed little book furnishes us with an annotated list of the vertebrates of his native county, which while largely of local interest is also a valuable work of reference for anyone interested in Scottish zoölogy. The birds number 224 species with 39 others reported on unsatisfactory evidence. An introduction dealing with the physical features of the region under consideration and a map, are valuable adjuncts to the Catalogue.— W. S.

Horsbrugh and Davies on The Game-Birds and Water-Fowl of South Africa.³— Part 2 of this attractive work is quite up to the standard of the first number already noticed in 'The Auk.' It includes plates and text of fourteen species of Francolin and three Quail — 2 *Coturnix*, 1 *Excalfactoria* — and one Button Quail, *Turnix*. The account of the breeding of the last species, the male of which incubates the eggs and cares for the young, is especially interesting.— W. S.

¹ Geographic Relationships of the Birds of Lord Howe, Norfolk and the Kermadec Islands. By W. R. B. Oliver. Trans. New Zealand Inst., Vol. XLIV, 1911, pp. 214-221. June 10, 1912.

² A Catalogue of the Vertebrate Fauna of Dumfriesshire by Hugh S. Gladstone | M. A., F. R. S. E., F. Z. S., M. B. O. U. | Author of "The Birds of Dumfriesshire" | J. Maxwell & Son | Dumfries | 1912.

³ The Game-Birds and Water-Fowl of South Africa by Major Boyd Horsbrugh, with coloured plates by Sergeant C. G. Davies. Part 2. London, Witherby & Co. July 2nd, 1912.

The Ornithological Journals.

Bird Lore. Vol. XIV, No. 4. July-August, 1912.

A list of Trees, Shrubs, Vines and Herbaceous Plants Native to New England, Bearing Fruit or Seeds Attractive to Birds. By F. H. Kennard.

Observations in a Laughing Gull Colony. By Francis Harper — At Cobbs Island, Va.

Some Nesting Habits of the Oregon Junco. By May R. Thayer.

Red-headed Woodpecker at Camden, N. J. By Julian K. Potter.

The Yellow-headed Blackbird. By Thomas S. Roberts. Educational Leaflet No. 57.

The Condor. Vol. XIV, No. 4. July-August, 1912.

Birds of the Cottonwood Groves [New Mexico]. By Florence Merriam Bailey.

Notes on the Wading Birds of the Barr Lake Region, Colorado. By Robert B. Rockwell. — With excellent photographs of nests.

Present and Future Status of the California Valley Quail. By H. C. Bryant.

A Journey to the Star Lake Country and other Notes from the Tahoe Region. By Milton C. Ray.

The Present Status of the Colorado Check-List of Birds. By W. W. Cooke. — A discussion of the species added by W. L. Solater in his 'History of the Birds of Colorado' and those rejected by him.

Prof. Cooke considers that seven species should be rejected from Solater's list while fifteen should be added upon the evidence here presented, making the total number of species for the state 403.

The Wilson Bulletin. No. 79. June, 1912.

A Study of the Home Life of the Brown Thrasher, *Toxostoma rufum*. By Ira N. Gabrielson. — The four young were tagged for identification and 775 feedings by the parents were recorded as to time, nature of food, and individual fed, and sex of parent. The results are tabulated in various ways and yield valuable results.

A Study of the Avifauna of the Lake Erie Islands (continued). By Lynds Jones.

The Oologist. Vol. XXIX, No. 6. June 15, 1912.

The Bewick's Wren [in southwestern Pennsylvania]. By S. S. Dickey

The Oologist. Vol. XXIX, No. 7. July 15, 1912.

Nesting of the Virginia and Sora Rails in Pennsylvania. By R. C. Harlow.

The Oologist. Vol. XXIX. No. 8. August 15, 1912.

The American Bittern [about Buffalo, N. Y.] By Ottomar Reinecke.

Breeding Birds of Marshall Co., Ill. By R. M. Barnes.

The Ibis. IX Series. Vol. VI, No. 23. July, 1912.

On the Birds of Ngamiland. By W. R. Ogilvie-Grant. With Itinerary and Field-notes by R. B. Woosnam. — An interesting account of a journey across the Kalahari desert to the Okavango marshes, Bechuanaland. The

collection of birds was by no means complete but 92 species are listed, of which five are new *Cisticola kalahariae*, *Bradypteris bedfordi*, *Certhilauda kalahariae*, *Trachyphonus nobilis* and *Pycnonotus tricolor ngamii*.

Contributions to the Ornithology of Egypt. No. III. The Birds of the Wadi Natron. By M. J. Nicoll.— This paper covers the ornithology of a chain of salt lakes situated northwest of Cairo, 171 species are listed.

Bird-notes in two Andalusian Sierras. By Captain H. Lynes.— A discussion of the life zones of some of the mountainous parts of Spain — San Cristobal and Sierra Nevada — with a list of 82 species.

Observations on the genus *Careba*, together with an Annotated List of the Species. By Percy R. Lowe.— An exceedingly interesting Monograph with a correlation of the distribution of the species with geological history. Two main color types exist, corresponding quite well with the mid-tertiary land areas. That covering the Central American and Andean region has extended by a probable ancient land bridge to Jamaica, Haiti and Porto Rica, while the species of the Lesser Antilles belong to the Brazilian type, these islands having been probably formerly connected with the eastern coast region of Venezuela. 800 specimens were examined and 34 species and subspecies are recognized, *C. chloropyga cayennensis*, Cayenne, and *C. luteola montana*, Merida, Venezuela, are described as new.

Bulletin of the British Ornithologists' Club, CLXXIX.

Messrs. Wallis and Pearson describe the nesting of two Algerian Larks, *Rhamphocorys clot-bey* and *Ammomanes deserti algeriensis* and the Mediterranean Gallinule, *Porphyrio caerules*.

Mr. Ogilvie-Grant reports that Mr. Walter Goodfellow who has been exploring Mount Arizan, Formosa, had successfully brought to the coast living specimens of the splendid Mikado Pheasant, *Calophasis mikado*. He also describes the following new birds from Mr. Goodfellow's collection: *Horeites acanthizoides concolor*, *Brachypteryx goodfellowi*, *Parus ater pilosus*, and *Dicaeum formosum*.

Bulletin of the British Ornithologists' Club, CLXXX.

Mr. Ogilvie-Grant shows the distinctness of the three African Francolins, *Francolinus castaneicollis*, *F. botlegi* and *F. gosanus*.

Mr. Thomas Parkin records a specimen of *Terekia cinerea* from Kent, a new bird for Great Britain.

Dr. Percy R. Lowe's new race of the Lesser Black-backed Gull, *Larus fuscus britannicus*, is discussed at length.

Mr. H. J. Elwes describes briefly his recent journey to Formosa. The following new birds are described, *Erythrocerus nyasa* Ogilvie-Grant, Nyassaland: and *Scops spurrelli* Ogilvie-Grant, Ashanti.

Appended to this number is a paper on the birds of the Island of Shaweishan by J. D. La Touche revised by C. B. Rickett. This investigation was financed by the Ornithologists' Club for the purpose of obtaining information on the migration of birds on the Chinese coast. 193 species are listed.

The Avicultural Magazine. Vol. III, No. 8. June, 1912.

Notes on Sexual Selection. By Frank Finn (concluded in July number).

Diary of Birds seen on the White Nile (concluded). By Richard Staples-Browne.

Wintering Cranes in New England. By J. C. Phillips.

British Birds. Vol. VI, No. 1. June 1, 1912.

The Lesser Black-backed Gull of the British Isles. *Larus fuscus britannicus* subsp. nov. By Percy R. Lowe.

Tengmalm's Owl captured in Northumberland. Its Behaviour in Captivity. By J. M. Charlton.

British Birds. Vol. VI, No. 2. July 1, 1912.

Robert Sibbald and his Prodomus. By W. H. Mullens.— Extracts and plates from this curious old work.

British Birds. Vol. VI, No. 3. August 1, 1912.

The Terek Sandpiper in Kent. A New British Bird. By Thomas Parkin.

Bird Notes. June and July, 1912.

Birds of Gambia. By E. Hopkinson (continued in both numbers). Colored plate of *Chloropsis aurifrons* in July.

The Emu. XII, Pt. 1. July, 1912.

Field Ornithology in South Australia — By Capt. S. A. White.— Account of a collecting trip to the Eyre peninsula with field notes on many species.

Examination of Contents of Stomachs and Crops of Australian Birds — by J. Burton Cleland.— 105 stomachs of 53 species.

New Birds for Australia. By A. J. Campbell (published separately, May 21, 1912).— New species are *Ptilonorhynchus minor*, Heberton Range; *Ptilotis carpentariensis* Burketown, Gulf of Carpentaria; *Ptilotis subchrysa*, Northern Queensland.

Lilac nape-band on Female Bower-Birds (*Chlamydodera*). By H. L. White — shown to occur on some females beyond question.

Descriptions of eggs of *Ptilonorhynchus minor* and *Ninox strenua*. By H. L. White.

Metallic Starlings (*Calornis*). By E. J. Banfield.— Observations on nesting and habits.

Breeding Habits of White Tern (*Gygis alba*) of the Kermadec Group. By R. S. Bell.— An exceedingly interesting account with photographs showing the egg and young. The egg is always deposited on a limb or leaning trunk of the Pohutukawa tree (*Metrosideros villosus*) on flat or slightly hollowed places in the bark. There is no nest structure whatever.

Oologists in the Mallee. By F. Erasmus Wilson.— Notes on 79 species with several excellent photographs of nests and birds.

Kangaroo Island Reserve.— B. J. W. Mellor.— Urges the enlargement of the small area now protected by the government.

Bird Life near Home. By Thos. P. Austin.

Forgotten Feathers.— Lewin's Birds of New Holland, 1808. By Gregory M. Mathews.

Journal of the South African Ornithologists' Union. VIII,
No. 1. June, 1912.

On some Birds in the Durban Museum. By E. C. Chubb.

Notes on the Migratory Birds of the Buffalo River Basin. By Rev.
Robt. Godfrey.

Field-Notes on Birds collected at Blaauberg, N. Transvaal. By F. O.
Noome.

Description of a New Flycatcher. By Austin Roberts.—*Tarsiger
stellatus transvaalensis*, subsp. nov., Woodbush, Transvaal.

Notes on a Collection of Birds in the Transvaal Museum from Boror,
Portuguese East Africa. Part II. By Austin Roberts.—*Petronia
superciliaris bororensis*, *Pycnonotus layardi pallidus* and *Cisticola rufica-
pilla bororensis*, subsp. nov.

Ornithologische Monatsberichte. June, 1912.

On the Song of Birds. By Fritz Braun.

On *Crateropus caudatus altirostris* Hart. By N. Sarudny — Regards it
as a synonym of *C. c. salvadorii* De Filippi.

Turdus viscivorus loudoni nom. nov. By N. Sarudny For. *T. v. sarudnyi*
Loudon.

Behavior of birds during the Solar eclipse of April 17, 1912. By Dr.
B. Ottow.

Description of a new Woodpecker from Colombia. By Dr. J. von
Madarasz. *Chrysophilus ujhelyii* from Aracataca.

Do young birds require the instruction of their parents? By Dr. J.
Gengler.

Lagopus lagopus brevirostris subsp. nov. By Dr. E. Hesse.— From
Altai.

Pitta habenichti Finsch., n. sp. New Guinea. Cf. also article in the
following number.

Ornithologische Monatsberichte. July–August, 1912.

Remarks on A. Voigt's Problems of Interpretation of Bird Notes. By
Fritz Braun.

Remarks on the Crested Larks of Suez, Sinai and Palistine. By Paul
Kollibay.

On the nest of *Tachornis parvus myochrous* in Dutch East Africa. By
Ludwig Schuster.

Iynx thorbeckei Rehw. n. sp. Kamerun.

Journal für Ornithologie. July, 1912.

Report on Bird Migration observations for 1911. By Dr. J. Thiene-
mann.

From Suez to St. Katherine's Monastery (Sinai). By O. Graf Zedlitz.—
An annotated list of 59 species (to be continued).

Ornithology of N. W. Mesopotamia and Interior Syria (continued).
By Dr. H. Weigold.

On the nuptial flight and call notes of the Marsh Hawks and Short-eared
Owl. By Dr. E. Hesse.

Ornithologisches Jahrbuch. XXIII. Nos. 3-4. May-August, 1912.

The Geographic Races of *Chloris chloris*. By A. Laubmann.—Seven are recognized.

The Forms of *Emberiza citrinella* L. 1758. By Dr. J. Gengler.—Four recognized.

On the Birds of the Island of Arbe (North Dalmatia). By Dr. G. Schiebel.

Several Reports on the invasion of Nutcrackers in the winter of 1911.

A review of Rob. Ritter v. Dornbrowski's *Ornis Romanis*. Contains remarks on the nature of certain new species here proposed.

Ornithologische Monatschrift. Vol. 37, No. 6-7.

No. 6 contains an article on Light-houses and Bird Protection. By Dr. Carl R. Henniche.

No. 7. Ornithological Observations on the island of Oesel (on the west coast of Russia). By Leon Freih. von Campenhausen.

Revue Française d'Ornithologie. IV, No. 39. July, 1912.

Ornithological Notes from Tunis (continued in No. 40). By Dr. Millet-Horsin.

Wintering of Indigenous and Exotic Birds in the Open Air. By A. René Bacon.

Revue Française d'Ornithologie. IV, No. 40. August, 1912.

The Harvest of the Ostrich Plumes.—A refutation of certain charges of cruelty.

Persistence of the Instinct of the Wild Duck in Captivity.—V. Meilheurat.

Ornithological Articles in other Journals.

Dewar, J. M. The Evolutions of Waders. (The Zoölogist, No. 851. May 15, 1912).—Discussion of the wheeling etc. of flocks of Shore-birds and their probable explanation.

Selous, E. Domestic Habits of the Red-throated Diver (concluded). (The Zoölogist, No. 852. June 15, 1912).

Harvie-Brown, J. A. Habits of the Whimbrel (*Numenius phaeopus*). (The Zoölogist, No. 853. July 15, 1912).

Stubbs, F. J. Notes on the Habits and Coloration of the Common Starling (*Sturnus vulgaris*). (The Zoölogist, No. 854. August, 1912).—Discusses metallic colors of feathers.

Ingram, C. On the Furze Warblers of France. (The Zoölogist, No. 854. August, 1912).—*Sylvia undata aremoricus* de Palluel, a valid race.

Harvie-Brown, J. A. The Fulmar: Its Past and Present Distribution as a Breeding Species in the British Isles. (The Scottish Naturalist. June, 1912).—A detailed discussion, with an excellent map.

Thomson, A. L. Aberdeen University Bird Migration Inquiry: First Interim Report (1909-12). (The Scottish Naturalist, June and July, 1912).—A report on reappearances of ringed birds,—56 cases are listed in these two installments.

Seth-Smith, David. On the Moulting of the King Penguin (*Aptenodytes pennanti*) in the Society's Gardens (Proc. Zool. Soc. London, 1912, pp. 60-62). Illustrated by photographs.

Crandall, Lee S. The Carolina Parakeet. (N. Y. Zool. Society Bulletin, No. 49, Jan., 1912).—Eleven specimens known to be living in Zoölogical Gardens.

Beebe, C. Wm. and Burtch, Verdi. Storm Bound Ducks. (N. Y. Zool. Society Bulletin, No. 51, May, 1912). On Lake Kenka. cf. also editorial in same number on The Tragedy of the Grebes dealing with the freezing of the New York lakes.

Publications Received.—**Barrows, Walter B.** Michigan Bird Life Published by the Michigan Agricultural College. 1912.

Beebe, C. William. New Blood Pheasants. Zoölogica. Scientific Contributions of the New York Zoölogical Society, Vol. 1, No. 10. August 17, 1912. pp. 189-193.

Bryant, Harold C. The Present and Future Status of the California Valley Quail. (The Condor, XIV, 1912, pp. 131-142).

Chapman, Frank M. Diagnoses of apparently new Colombian Birds. (Bull. Amer. Mus. Nat. Hist., XXXI, pp. 139-166. July 23, 1912).

Chapman, Frank M. A new Ibis from Mt. Kenia, British East Africa. (Bull. Amer. Mus. Nat. Hist., XXXI, pp. 235-238. August 6, 1912).

Gladstone, Hugh S. A Catalogue of The Vertebrate Fauna of Dumfriesshire. J. Maxwell & Son, Dumfries, 1912.

Grinnell, Joseph. A systematic List of the Birds of California. Pacific Coast Avifauna No. 8. Cooper Ornithological Club, Hollywood, California. August 30, 1912.

Horsbrugh, Major Boyd. The Game-Birds and Water Fowl of South Africa, with colored plates by Sergeant C. G. Davies. Part 2. London. Witherby & Co. July 2, 1912.

Mathews, Gregory M. The Birds of Australia. Vol. II. Pt. 2. London. Witherby & Co. July 31, 1912.

Miller, M. De W. A Revision of the Classification of the Kingfishers. (Bull. Amer. Mus. Nat. Hist., XXXI, pp. 239-311. September 12, 1912.)

Oberholser, Harry C. A Revision of the Subspecies of the Green Heron (*Butorides virescens* [Linnæus]) (Proc. U. S. Nat. Mus., 42, pp. 529-577. August 29, 1912).

Oliver, W. R. B. Geographic Relationships of the Birds of Lord Howe, Norfolk and the Kermadec Islands. (Trans. New Zealand Institute XLIV, 1911, pp. 214-221. June 10, 1912.)

Palmer, T. S., Brewster, C. E., and Earnshaw, F. L. Game Laws for 1912. U. S. Dept. of Agriculture, Farmer's Bull. 510.

Palmer, T. S. Directory of Officials and Organizations concerned with

the Protection of Birds and Game, 1912. Circular 88, U. S. Dept. of Agriculture.

Richmond, Charles W. Descriptions of five New Birds from the West Coast of Sumatra. (Proc. Biol. Soc. of Washington, XXV, pp. 103-106. June 15 (= 14) 1912.)

Warren, Edward R. Some North-central Colorado Bird Notes. (The Condor, XIV, 1912, pp. 81-104.)

Willett, George. Birds of the Pacific Slope of Southern California. Pacific coast Avifauna No. 7. Cooper Ornithological Club, Hollywood, Cal. July 25, 1912.

Shufeldt, R. W. American Ducks and How to Distinguish them. Pts. V-VII. (Outer's Book, July-Sept., 1912.)

Thayer, Abbott H., Concealing Coloration, an answer to Theodore Roosevelt. (Bull. Amer. Mus. Nat. Hist., XXXI, pp. 313-321, September 14, 1912.)

Abstract Proc. Zool. Soc. London, No. 111. June 4, 1912.

Ardea, I, No. 2. July, 1912.

Austral Avian Record, I, No. 3, June 28, 1912.

Avicultural Magazine (3) III, Nos. 8-11, June-September, 1912.

Bird-Lore, XIV, No. 4, July-August, 1912.

British Birds, VI, Nos. 1-4, June-September, 1912.

Bulletin, British Ornith. Club, No. CLXXVIII-CLXXX and Index to Vol. XXIX, April-June, 1912.

Condor, The, XIV, No. 4, July-August, 1912.

Emu, The, XII, Pt. 1, July, 1912.

Forest and Stream, LXXVIII, No. 26, LXXIX, Nos. 1-12.

Ibis, The, (9) VI, No. 23, July, 1912.

Oölogist, The, XXIX, Nos. 6-9, June-September, 1912.

Ornithologisches Jahrbuch, XXIII, Nos. 3-4, May-August, 1912.

Ornithologische Monatsschrift, 37, Nos. 6-8, June-August, 1912.

Ottawa Naturalist, The, XXVI, Nos. 3-4, June-July, 1912.

Proceedings California Acad. of Sciences, (4) I, pp. 289-430, III, 147-160, III, 183-186.

Proceedings and Transactions, Nova Scotia Inst. of Science, XIII, Pt. 1, June 26, 1912.

Records of the Australian Museum, VIII, No. 3, May 6, 1912; IX, No. 1, April 26, 1912.

Revue Française d'Ornithologie, IV, Nos. 39-40, July-August, 1912.

Science, N. S., XXXV, No. 913; XXXVI, Nos. 914-925.

Scottish Naturalist, The, 1912, Nos. 6-9, June-September, 1912.

West Virginia Fish and Game Protective Association, Report of Fifth Annual Meeting.

Wilson Bulletin, The, XXIV, No. 2, June 1912.

Verhandlungen der Ornithologischen Gesellschaft in Bayern XI, Heft. 2, July 1, 1912.

Zoölogist, The, (4) XVI, Nos. 186-188, June-August, 1912.

CORRESPONDENCE.

The Functions of the A. O. U. Committee on Nomenclature.

EDITOR OF 'THE AUK':

Dear Sir: The appearance, in your July issue, of the Sixteenth Supplement to the A. O. U. Check-List, and of comments in your 'Notes and News' column relative to the uses of the A. O. U. Committee, prompt me to give expression to some ideas which have doubtless occurred independently to not a few lay students of North American birds.

If I infer correctly, the comments in question were written by a member of the Committee; hence they are in a measure an avowal of purpose, and to a degree authoritative. From these comments, and from the recent output of the Committee, we may safely adduce the following as being the main, if not all of, the functions of the Committee.

(1) To decide upon a system of groupings, that is, upon what genera and higher groups are to be recognized, and upon the sequence of these and the contained species. (2) To decide upon cases of nomenclature, where from various contingencies the correct name of the species may be in more or less doubt. (3) To determine the boundaries of 'North America,' and to pass upon the claims for inclusion in the North American list, of various vagrant species, so rare that the evidence of occurrence must be examined and weighed. (4) To decide as to the merits of the various finely differentiated subspecies which are being named by systematic students, both as to the validity of the characters assigned, and as to whether the degree of difference is sufficiently well marked to warrant recognition in the official Check-List.

The great value of a committee of arbitration in the first three of these functions is beyond any possibility of dispute. The personnel of the Committee as now constituted is of that high grade of judicial ability and long experience which brings confidence in their rulings in these respects. For these functions alone the existence of such a committee is fully warranted. The chief complaint that I can seriously offer in these regards is that in the recent Third Edition of the Check-List the matter of presenting a modern system of classification was shirked altogether, on the plea (flimsy, was it not?) that some inconvenience would result! This was a grievous error, which every bona fide student of ornithology deplora.

A further disappointment was met, when the Sixteenth Supplement came to hand lacking a single nomenclatural ruling — this being preeminently the service which the Committee is well fitted to render. Numerous proposals of changes in generic and specific names have lately been made. Undoubtedly many names previously in use in the Check-List require replacement upon perfectly good grounds. And an authoritative decision in each case, not long delayed, is a desideratum of the active student of birds. Postponement of such action is provoking.

While in such matters as the above one may accept the conclusion of some one systematic worker, the elements in each case are of such a nature that a properly qualified committee of several members can undoubtedly render a correct ruling in a greater number of cases than can one man. Hence the demand for committee action, over that of any one individual.

Examination of the Sixteenth Supplement shows that of proposed additions to the Check-List from the category of vagrant species, four were accepted and three were rejected. In this function (number 3) the rulings of the Committee are gladly accepted. They have considered the evidence offered in each instance, and have rendered judgment.

Further scrutiny shows that in the Sixteenth Supplement, function number 4 was exercised in 34 cases. Thirteen newly proposed subspecies were accepted, 19 were rejected, and two proposed cancellations were rejected. It is this function that, to my mind, has been unsatisfactorily performed. Ha! I can hear the scornful remark from at least seven directions: The splitter is sore; his pet subspecies were turned down! Granted; but let me try to discuss the problem dispassionately, and may my readers consider the matter in like mind.

Up to the present time the Committee has with more and more difficulty tried to meet two totally different ideals in the matter of including subspecies in its Check-List. The trained student of speciation, whom certain thoughtless ones attempt to ridicule by the term 'splitter,' has earned the ability to distinguish characters of phylogenetic value from the host of others which are the confusion of the amateur. This kind of specialist finds it more and more in his power to discriminate the lesser differentiated forms; his senses, his tools for measuring, are becoming refined, and he can discriminate differences which the dilettante cannot. Liken the development of the professional systematic ornithologist to that of the trained microscopist, in whatever field. Would anyone for a moment entertain seriously the dictum that any organisms, which future increase in precision on the part of both the individual and his instruments enable him to discern, should be deemed beneath notice, "not worthy of recognition by name," just because the amateur finds difficulty in seeing them?

Arguments along this line ought to be unnecessary in defense of the systematic ornithologist. The difficulty comes when the Committee is confronted with the results of his refined work. Its action has been anything but consistent. Sometimes the Committee accepts the results of the systematist's work in their entirety; occasionally the whole thing is discarded; and in the last supplement forms are 'accepted' and 'rejected' in hit or miss fashion, to the wonderment of the beholder who happens to be posted in any of the groups affected.

Evidently the Committee feels that it cannot go to the limit. The populace will not stand for it!

For there is, on the other hand, the vast majority of amateur bird students who are confused by the multiplicity of names. Yet they require a reference list of North American birds. Many of the subspecies already

in good standing on the Check-List represent forms far beyond their limited powers of discrimination. They are confused by differences due to age, sex, season, individual variation, and such adventitious factors as wear and fading. This unpopularity of the subspecies is evident in the way they are treated in most popular works on ornithology. They are either disposed of in diamond-type footnotes or appendices, or they are omitted altogether. Not infrequently such opprobrious terms are introduced as 'alleged,' 'extremely slight,' 'subjective,' etc. Yet ninety-nine percent of bird students will resent most vehemently any intimation that their powers of discrimination are limited!

The poor Committee has the amateur on the one hand and the specialist on the other. And neither of these constituencies is satisfied with the present rulings in the Check-List. The term ornithology is a mighty broad one; the phases of the study are many. A man may become an eminent ornithologist in psychology, in anatomy, in classification in the large, in economics — and not have need of any particular ability or knowledge in the technique of species-discrimination. The amateur, as far as subspecific discriminative ability is concerned, constitutes practically all of the Associates of the A. O. U., surely a majority of the Members, and not a few of the Fellows.

Why does the Committee discommode this great majority by 'accepting' as many subspecies as it does? Is it fair to the conscientious student of speciation to maltreat the results of his work as instanced in the genus *Dryobates* in the Sixteenth Supplement?

It seems clear, upon any basis I can think of, that the A. O. U. Check-List with its supplements is of late failing markedly in its usefulness. This is because of the Committee's unhappy attempt at striking a mean between the demands of amateur and specialist. The interests of one or the other should be sacrificed; and as the amateur is in the vast majority, the Check-List should be remodeled to meet his requirements. An expeditious way to do this would be to eliminate all subspecies. There would thus be but one name for the Robin from the Atlantic to the Pacific, only one Song Sparrow and one Horned Lark in all North America. A statement could be appended, wherever appropriate, to the effect that there is geographic variation within the range, birds from desert regions being small and pale, those from the northwest being large and dark; etc.

I venture to say that such a consummation would be hailed with delight by the rank and file of bird students, if not by every one. The interpolation of subspecies in small type as in the Third Edition, is a confusion. As stated before, the subspecies problem as now handled is unsatisfactory to practically all concerned. Such a working list of North American birds should accord with the most modern findings in classification, nomenclature and geographic distribution. The Committee would find good use for its talents in keeping such a list up to date.

Now, I am not for one moment advocating cessation of activities on the part of the student of speciation. He must pursue his investigation

to the farthest limit made possible by his experience and keenness. And may his ability become sharpened until he can distinguish seven Song Sparrows where but one is now known! Furthermore, if one degree of differentiation requires a name, so does every other, even down to the finest discernible. The systematist will continue to provide names for the subspecies he discovers.

The futility of any committee attempting to pass judgment upon the findings of the specialist here becomes obvious. A very good reason is given in the editorial comments alluded to, though couched in an unfortunately disparaging tone: "The specialist working over a group of birds constantly for weeks at a time, unconsciously magnifies the differences which he finds between birds from areas, which he has reason to think, ought to yield separable geographic races." To express the idea with better respect for the judgment of the specialist, it is the worker in a particular group — the man who has scrutinized all available material with minute attention to detail, the man who has become proficient in picking apart the multifarious peculiarities between individual specimens and series, one who can appreciate mass effect — it is that man who is by far the best fitted to render verdicts as to the existence of subspecies.

It would be foolish for *me* to tackle the Hummingbirds of Middle America, even with the largest museum series of skins at hand, with the expectation of giving within seven days an opinion as to the validity of certain proposed forms. Who would place any reliance upon my conclusions? I would n't! If it is ridiculous for one person to attempt to pass judgment on a few subspecies of an unfamiliar group with but a few days study, it is logically seven times as ridiculous for seven men to make such an attempt, especially when 34 cases representing 18 genera are to be considered! There is no use making any bones about it — there is too much good evidence of the failure of the Committee in rendering just verdicts as between 'rejected' and 'accepted' subspecies in the Sixteenth Supplement. It is beside the object of the present communication to go into detail in this regard.

I do not mean disrespect towards any one of the Committee members, and certainly no one will arraign me on that score. All of them are busy men. At least three are ordinarily strenuously occupied with other matters than subspecies of birds. They give of their time generously; but who will maintain that in function number 4, it is worth their while from the standpoint of either the amateur or the specialist?

Nor am I advocating that there be no longer an official Check-List of North American birds to include all recognizable subspecies. On the contrary, this is an eminently desirable thing, to constitute a record of achievement in research in avian speciation. I have no doubt, too, but that a large number of non-specialists will always be interested in such results, enough to well warrant its publication.

I do not, however, believe that any committee could handle such a proposition. Rather, let there be a systematic editor appointed by the president of the A. O. U., one qualified through his accuracy in handling

scientific names typographically, as well as by attainments in his own field. Let him be located, preferably, at Washington, because of the library and museum facilities there. His task should be, not to pass judgment upon any forms not in his own special group or groups, but to unify the whole output. This should consist of a co-ordinated set of contributions each from the specialist most familiar with the group concerned. It may well be, then, that but a single person shall stand as authority for the status of forms in any one group; or one student may be responsible for several groups which he may have worked in. The danger of uneven treatment throughout the entire production could not of course be wholly eliminated, because of variability in personal ability or standards, and this in spite of careful editing. But the results would surely be far nearer the truth than those exemplified in the Sixteenth Supplement.

To summarize: the present Check-List, especially as including the last supplement, is unsatisfactory to both the amateur and the specialist in respect to the subspecies problem. It is suggested that a new Check-List, *with subspecies omitted altogether*, would be hailed with appreciation by the great majority of bird students, with whom such an abridged list would meet all requirements.

The Committee, as at present constituted, has all the qualifications to enable it to compile and keep up to date such a Check-List. Such a list of *species* should prove even more popular than the present one.

It is further suggested that an entirely distinct publication, though second in importance, would justify itself, enumerating the results of the specialist's studies to the very limit to which his perceptions allow him to proceed. But it is contended that no committee can have the qualifications in either time or ability, to pass judgment upon all the proposed cases. Rather should such a technical list be a carefully edited compendium of contributions from all specialists of recognized standing, each treating of the group or groups in which he has personally worked.

Respectfully submitted,

JOSEPH GRINNELL.

Museum of Vertebrate Zoölogy,
Berkeley, California,
August 27, 1912.

[In reply to Mr. Grinnell's communication, the author of the editorial remarks on the A. O. U. Committee on Nomenclature and its functions, in 'Notes and News' of the July Auk, begs to say that while he is a member of the Committee, the remarks represented his own personal views on the matters discussed and may or may not reflect the opinions of the Committee as a whole. The same may be said of the following comments upon Mr. Grinnell's communication.

As to the question of classification raised by Mr. Grinnell, the writer feels that there is perhaps as much to be said on one side as the other. If there had been a generally recognized system available it would unques-

tionably have been adopted, but there was not; and the diversity of opinion among avian taxonomists still prevails. Furthermore it should be remembered that a Check-List is by no means necessarily a classification. Its very existence is for convenience, and so it is no light matter to overthrow a sequence, followed by practically all writers on North American birds for a quarter of a century, on the plea of being more scientific when we get nothing more stable than that which we discard.

As to the subspecies question with which Mr. Grinnell is chiefly concerned, we hardly think that he is serious in believing that a list of the binomial names in the present Check-List would answer the needs of the great bulk of the membership of the A. O. U. which he classes as 'amateurs' in matters of subspecific discrimination. He knows perfectly well that there are very many subspecies which are more easily distinguished than are certain species, and for these we must have names. For the purposes of ornithological investigation along any line — life history, habits, geographic distribution, migration, taxonomy, economics, etc. — we must have the birds of the country divided up into minor groups, species or subspecies as you will. The only question is, where shall we draw the line in recognizing the differentiation that nature has effected? The question is a *practical* one, just as the whole matter of naming is practical, and when we recognize by name differentiations so slight that an ornithologist cannot tell what bird he has before him until he submits it to a 'specialist in speciation' for study, then the process has gone too far for general purposes. There is however no test by which we can tell when we have gone too far. The problem is one entirely of degree in which personal opinion and individual ability enter into every case. As already stated the line cannot be drawn between the species and the subspecies, because by our Code they are distinguished not by degree of difference but by the criterion of intergradation. In an effort to fix this line the A. O. U. established the Committee believing that the vote of a Committee would represent the nearest approach possible to the desired result.

We do not believe that the efforts of the Committee have been so entirely unsatisfactory as Mr. Grinnell implies, except of course to 'students of speciation' who make a specialty of naming differentiations no matter how small, regardless of whether the results of their work can be utilized by specialists in the various other branches of ornithology. It was for the latter we think that the Check-List was conceived. It was surely never intended for such a 'specialist in speciation' as Mr. Grinnell predicts who would name every finest discernible differentiation and would if possible make 140 races of Song Sparrows out of the 20 now recognized. In European ornithology the same effort is evident in check-lists and catalogues to recognize practical subspecies but to reject those based in extremely slight differentiations, and this by ornithologists who can hardly be charged with catering to the amateur.

Mr. Grinnell will perhaps understand better the attitude of the large majority of ornithologists toward the subspecies if he will but consider

his own attitude toward the genus. He must use generic names in his 'speciation' researches but he has no inclination to halt the latter while he investigates generic taxonomy. Consequently he cheerfully accepts the opinions of the A. O. U. Committee on all generic problems and even goes so far as to say that this is a function in which "the great value of a committee of arbitration is beyond any possibility of dispute." In exactly the same spirit investigators in other fields of ornithology accept the decisions of the Committee in regard to subspecies. As a matter of fact the two problems are precisely similar and the opinion of the Committee is not one whit more valuable in deciding how many genera should be recognized than it is in the case of recognition of subspecies. However we are digressing from the point at issue. Mr. Grinnell charges that the Committee has been inconsistent — has gone too far in some cases and not far enough in others. This may readily be granted and right here lies the crux of the whole matter. How is the Committee to know when it has overstepped the line? How can any one judge of consistency in such matters? Subspecies are separated from one another by all possible degrees of difference and the whole question as before stated is one of individual opinion.

Mr. Grinnell's suggestion of a committee of one for each family or genus, as the case may be, does not appeal to the writer as practicable and he doubts whether the opinion of a selected specialist on Fringillidae, as to the number of recognizable races of *Melospiza* in California would be any more acceptable to Mr. Grinnell than are the opinions of the long-suffering Committee.

If any practicable plan can be devised however by which the work of the 'speciation specialist' may receive full recognition without impairing the utility of the Check-List for other specialists, the writer would give it his hearty support. And if the Committee could be relieved of the burden of passing upon the merits of the various proposed subspecies he feels sure that the proposition would be hailed with delight 'from seven different directions.'

Any departure along these lines however would necessitate a reconsideration of all the subspecies of the Check-List and could not be exploited until a new edition was demanded. Perhaps by that time a committee may be found which will undertake this task and divide the subspecies into two categories, (1) those regarded as of practical utility, as above explained; (2) those recognized by 'specialists on speciation'. Then we should have the entire history of each group before us. This would probably approach nearer to consistency than does the present Check-List, in which most of the inconsistency arises from the different attitude and different make-up of the Committee at the times at which the various cases were considered. This plan too would accord in a measure with Mr. Grinnell's suggestion except that the utility line would not be drawn between the species and the subspecies a proposal that as already explained is quite indefensible. And now just a word upon some remarks of Mr. Grinnell regarding the work of the Committee. He charges that the Committee has felt the necessity

of pleasing both the amateur and the specialist. In this the writer thinks he is mistaken. The Committee has tried to decide each subspecies case upon its merits regardless of how its opinion might affect any individual or class. Such inconsistencies as have resulted were unintentional and due to the lack of any standard in such matters — not to any feeling of obligation to anyone.

The only instance where the Committee has acted in deference to the views of amateur ornithologists — and scientific ones too as it happens — was in the withholding of nomenclatural opinions from the Sixteenth Supplement. This was done in view of the widespread disgust at 'name shuffling' and the diverse interpretation of Article 30 of the International Code, pending an opinion by the International Commission. It was thought far better to temporarily withhold decisions which might have to be reversed in a year or two.

Further on Mr. Grinnell adopts a rather unfortunate simile in discussing the Committee's work. He rightly contends that his judgment upon the validity of proposed new forms in a group of Middle American Humming-birds with which he was quite unfamiliar would not be worth much if based upon but a few days study. In the case of the Committee however he seems to forget that the members are fairly familiar with North American birds and that many of the races which modern 'speciation specialists' have honored with names were worked out but not named by members of the Committee years ago. Furthermore what knowledge one member of the Committee lacks another may possess so that the efforts of the Committee are certainly not seven times as ridiculous as the efforts of any one of them individually. In not a few cases moreover the Committee has had more material before it than had the describer of the proposed new race.

The writer welcomes Mr. Grinnell's communication because it shows the proper spirit of coöperation. Everyone will have different opinions on such matters as he has discussed and only by bringing them forward can we achieve results approximately satisfactory to all. The Committee certainly desires to produce satisfactory results and to raise the Check-List to the highest efficiency and if its methods are wrong the sooner the fact is demonstrated the better.

WITMER STONE.]

Aves in the International Catalogue of Scientific Literature.

THE EDITOR OF 'THE AUK':

Dear Sir: It has occurred to me that the accompanying table may be of some interest to your readers and may also incidentally be of assistance to the writer who is engaged in the task of compiling the 'Aves' portion of the Zoölogical Record and the International Catalogue of Scientific Literature. The Zoölogical Record which was founded nearly 50 years

ago by a small body of subscribers and was subsequently taken over by the Zoölogical Society was in 1906 amalgamated with the zoölogical portion of the International Catalogue of Scientific Literature and has now reached its 48th annual issue. The International Catalogue of Scientific Literature was established in 1900 and is in effect a continuation of the Royal Society's Catalogue of Scientific Papers which when completed will cover the period 1800-1900.

By an arrangement made between the Royal Society and the scientific representatives of most of the other countries of the world appointed by their respective governments an International Organization was established, by means of which each of the component countries collects the titles of all papers and works of scientific importance published within their limits and forwards them to the International Bureau in London. These titles which are all written on separate slips, are by the Bureau distributed to the recorders or compilers of the various subjects of which there are 17 in all, Zoölogy forming one.

The duty of each Recorder is to arrange all the titles received for publication and to search for other titles which have been omitted or passed over by the regional bureaus of the co-operating states. It is also the duty of the Recorder to collect titles from those states which do not co-operate as well as those published in the British Islands.

As regards the Aves portion of the Catalogue I find some countries provide a very complete series of titles while others do not and one of the objects of this letter and the accompanying table is to draw attention to this fact. In the first column of the table is given the number of titles collected by the Recorder himself, in the second column the number which has reached him through the Bureau. It will be seen that out of 307 titles of Ornithological papers and publications coming from the United States 40 were supplied by the Recorder.

It is also very desirable for the Recorder to verify all the titles sent in so as to be able to reject those which are of no scientific value and importance. I find in the case of 'Aves' titles from the United States that this is by no means easy as so many of the minor and more local periodicals are not to be found on the shelves of the great scientific libraries in London. For instance I have not been able to see in London such publications as *Bird Lore*, *Cassinia*, the *Journal of the Maine Ornithological Society* and other local journals of the same type. I hope therefore that if these lines are seen by the editors of these journals they will take steps to arrange that copies may be regularly transmitted to the Library of the Natural History Museum in Cromwell Road or to that of the Zoölogical or Royal Societies so that the Recorder may have an opportunity of seeing them.

Yours faithfully,

W. L. SCLATER,

Corresponding Fellow A. O. U., Recorder of Aves.

TITLES OF 'AVES' OF 1911.

	Collected by the Recorder	Sent in by the Regional Bureaus.	Total.
British Islands	371	—	371
United States	40	267	307
Germany	37	298	335
France	65	74	139
Russia	0	115	115
Australia	15	31	46
Italy	12	24	36
India	20	12	32
Austria	1	28	29
Hungary	17	7	24
Switzerland	8	14	22
Sweden	2	17	19
Denmark (and Iceland)	2	15	17
Holland	4	12	16
Finland	0	11	11
South Africa	3	8	11
Canada	8	0	8
Belgium	6	0	6
Malay Peninsula	6	0	6
Norway	2	2	4
Philippine Islands	4	0	4
Japan	0	3	3
British East Africa	3	0	3
Cuba	3	0	3
Argentine Republic	3	0	3
Bohemia	1	1	2
Portugal	2	0	2
Luxemburg	1	0	1
Roumania	1	0	1
Servia	1	0	1
Egypt and E. Soudan	1	0	1
Barbados	1	0	1
British Guiana	1	0	1
Brazil	1	0	1
Mexico	1	0	1
Chile	1	0	1
New Zealand	1	0	1
	645	939	1584

NOTES AND NEWS.

WILHELM AUGUST HEINRICH BLASIUS, M. D., Ph.D., a Corresponding Fellow of the American Ornithologists' Union, died at his home, Brunswick, Germany, on May 31, 1912, after a prolonged illness. He was born in Brunswick, July 5, 1845, son of the celebrated naturalist Prof. Dr. Johann Heinrich Blasius, the author of 'Säugethiere Deutschlands' and co-author with Count Keyserling of 'Die Wirbelthiere Europas'. His brother the equally celebrated ornithologist Rudolph Blasius died only a few years ago.

Wilhelm Blasius was since 1871 professor of Zoology and Botany in the Herzogliche Technische Hochschule in Brunswick and was director of both the Natural History Museum and the Botanic Garden, in the same city, as well as a member of the Council of the Deutsche Ornithologische Gesellschaft and member and honorary member of many scientific societies. He was a voluminous author of papers and memoirs dealing with ornithology, mammalogy, anthropology and archæology, among them a monographic account of the Great Auk (*Plautus impennis*) which appeared in 1903.

Prof. Blasius visited America in 1907 as a delegate to the International Zoological Congress in Boston and will be remembered by those who met him as a man of the most lovable disposition and sterling qualities, whose high scientific attainments were combined with a personality which attracted all with whom he came in contact.

JOHN GERRARD KEULEMANS, the well known artist, died in London, England, March 29, 1912. He was born June 8, 1842, at Rotterdam, Holland, but did not become well known until he settled in England in 1869. From that time on almost every illustrated ornithological work published in England contained products of his brush, from the first volume of the 'British Museum Catalogue of Birds' to the last part of Mathews' 'Birds of Australia.'

ONE is astonished in glancing through the foreign ornithological journals to see the extent to which bird-banding or 'ringing' has been carried recently and the returns that have been obtained. The results are not only interesting and valuable in the case of migrants shot or captured far from the place at which they were banded, but also in the case of 'resident' species.

Mr. N. H. Joy of Bradfield, Berkshire, England, captured and 'ringed,' during two years, upwards of 1500 Starlings in a cage trap located near his house, besides 'ringing' a number of nestlings. Many of these birds were re-caught several times and the accumulation of data is yielding valuable results. Mr. Joy finds that he catches in the trap only about 5% of the nestlings 'ringed' each year, and feels sure that a large number of them

must leave the immediate vicinity where they were hatched. He finds also that a large proportion of winter Starlings are migrants or visitors from elsewhere. Such data bear directly upon the extent of migration in so called resident birds, such as our Song Sparrow which is present as a species throughout the year over a large part of its range, though there is doubtless a migration of individuals to a greater or less extent.

The most remarkable case of long flight recorded among the captures of 'ringed' birds was that noticed in the 'Ornithologische Monatsberichte' for July-August, of a nestling Gull (*Larus ridibundus*) banded at Rossitten, Germany, on the east coast of the Baltic Sea, July 18, 1911, and shot in November of the same year near Bridgetown in the island of Barbados!

MR. LEO E. MILLER, who has been collecting in Colombia for the American Museum of Natural History, and whose success in discovering the nest of the Cock-of-the-Rock was mentioned in the last issue of 'The Auk', reached New York City on September 9, after eighteen months' continuous field work in the tropics. Mr. Miller brought with him some twenty-three hundred birds and mammals collected since the expedition left Cali in the Cauca Valley in February, 1912. A recently completed government road over the eastern Andes enabled Mr. Miller to go from the headwaters of the Magdalena to the headwaters of the Amazon in the Caquetá territory.

He is doubtless the first zoölogical collector to penetrate this region, and during the thirty days which he worked there secured eight hundred birds and mammals; practically none of which were represented in the Museum's previous Colombian collections.

THE U. S. Bureau of Fisheries now has a naturalist on the Pribilof Islands whose duty it is to study not only the fur seals and blue foxes, but all other natural history questions relating to the islands. Exceedingly interesting results are already coming in and we learn from Dr. Barton W. Evermann that in a collection recently received there are specimens representing eighteen species of birds new to the avifauna of the Pribilofs of which four are new to North America. A detailed account of them will appear in the next number of 'The Auk.'

WE learn from 'The Ibis' that Dr. A. J. R. Wollaston sailed May 24, for Borneo where he will prepare for another expedition to New Guinea in conjunction with Mr. C. B. Kloss. They hope to reach the Snowy Range and if possible to ascend Mt. Carstensz 15,964 ft.

A FITTING tribute to the last ornithological effort of the late Dr. Bowdler Sharpe — his 'Hand-List of Birds' — is a general index to this work which has been recently issued by the British Museum. This index has been edited by Mr. W. R. Ogilvie-Grant, while the actual task of amalgamating the indices of the several volumes was accomplished by his assistant, Mr. Thomas Wells. It is interesting to know that a specially prepared copy

of the 'Hand-List' has been provided for use in the Museum in which is noted the number of the cabinet and drawer in which each species is to be found. When Dr. Sharpe took charge of the collection in 1872 it consisted of about 30,000 specimens while at the time of his death it was supposed to consist of about 500,000 skins and eggs. We find in the index two genera, *Sharpia* and *Bowdleria* and forty-one species named in honor of Dr. Sharpe, more namesakes apparently than have been bestowed upon any other ornithologist.

THE ANNUAL GENERAL MEETING of the British Ornithologists' Union for 1912 was held in London on May 8th. The officers for the ensuing year are President, Dr. F. DuCane Godman; Secretary, Mr. J. Lewis Bonhote; while Mr. William Lutley Sclater was chosen editor of the tenth series of 'The Ibis' covering the six years beginning with 1913.

Medals were awarded to the following members of the British Ornithologists' Union Expedition to New Guinea: Mr. Walter Goodfellow, Dr. A. F. R. Wollaston, Mr. G. C. Shortridge and Mr. Claude H. B. Grant. It was announced that the new edition of the 'List of British Birds' published in 1883 would be ready for the press during the coming winter.

DOUBLEDAY, PAGE & COMPANY, Garden City, New York, announce a work on the Birds of Eastern North America by Chester A. Reed, with 408 illustrations in color and many in black and white.

WE are informed that Mrs. M. Blasius, Inselwall 13, Braunschweig, Germany, sister-in-law of the late Prof. Wilhelm Blasius desires to dispose of the specimen of the Great Auk which was contained in his collection. Year by year the specimens of this interesting bird find their way into the public museums where they are likely to remain permanently, so that this is probably one of the last opportunities that will occur of obtaining a specimen.

Soon after the organization of the Delaware Valley Ornithological Club in 1890 the members began to form a collection of the nests and eggs of the birds breeding in Pennsylvania and New Jersey, and presented it to the Academy of Natural Sciences of Philadelphia for exhibition in the museum. Later the collection was extended to include specimens of the birds as well, and additional nests were secured, until at the present time all the birds of the two states are represented with the exception of a few accidental stragglers, while out of about one hundred and fifty species known to nest within the region, the nests of one hundred and thirty are represented, all of them actually obtained in Pennsylvania or New Jersey. In many cases accessories have been added and the nest and birds mounted in a natural group. The collection has recently been entirely rearranged and displayed

to much better advantage, and every effort is now being made by the Club to secure nests and eggs of the few species still lacking in order that the collection may be absolutely complete.

. As already announced the thirtieth stated meeting of the American Ornithologists' Union will be held at Cambridge, Mass., November 12-14, 1912, with a business meeting of the Fellows on the evening of the 11th; all Members and Associates are urged to attend the sessions. Only those who have attended previous meetings realise how stimulating is this annual association with fellow ornithologists, and how much each one can advance the cause of bird study by helping to swell the roll of those present.

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ERRATA.

Page	30, line 22, for	<i>Sialia sialia</i>	read	<i>Sialia sialis</i> .
"	40, " 26, "	<i>Catophophorus</i>	read	<i>Catoptrophorus</i> .
"	76, " 15, "	<i>macularius</i>	read	<i>macularia</i> .
"	80, " 14, "	"	"	"
"	83, " 42, "	<i>polyglottus</i>	read	<i>polyglottos</i> .
"	112, " 34, "	<i>Tringites</i>	read	<i>Tryngites</i> .
"	135, " 10, "	<i>Onocratalus</i>	read	<i>Onocrotalus</i> .
"	182, " 9, "	<i>phrrhula</i>	read	<i>pyrrhula</i> .
"	238, " 33, "	<i>phasianellis</i>	read	<i>phasianellus</i> .
"	387, " 3, "	Henninger etc.	read	Grönberger, Auk, 1912, p. 109.
"	411, " 7, "	<i>falimellus</i>	read	<i>falcinellus</i> .
"	424, " 20, "	<i>griseiceps</i>	read	<i>griseiceps</i> .
	" 23, "	<i>ioniul</i>	read	<i>ioniae</i> .
	" 25, "	<i>Barbater</i>	read	<i>Barbatula</i> .
	" 26, "	<i>supæ</i>	read	<i>super</i> .
	" 31, "	London	read	Loudon.

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